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Selectional Preferences of Semantically Primitive Verbs in English: The periphrastic causatives and verbs of becoming

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Selectional Preferences of Semantically Primitive Verbs in English: The periphrastic causatives and verbs of becoming

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Abstract

Selectional Preferences of Semantically Primitive Verbs in English: The periphrastic causatives and verbs of becoming

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Analyses of English verb meaning often rely on quasi-aspectual operators embedded in event structures to explain shared properties across classes. These operators scope over temporally basic meaning elements that make up the idiosyncratic semantic core of complex verbs. While the inventory of operators – or semantic primes – differ from proposal to proposal, they are generally presented as a closed class that includes at least CAUSE and BECOME, and their presence and location in event structures account for several alternation and ambiguity phenomena. In this study, I investigate a number verbs whose decompositions would include only operator(s) and event structure frames under most current decompositional lexical theories; in particular, the periphrastic causatives (*cause*, *make*, etc) and the verbs of becoming (*become*, *get*, etc). I account for differences in the selectional behavior of these verbs by positing incorporated meaning components beyond the purely aspectual or event structural. Based in part on regularities among corpus collocations, I propose additional meaning distinctions among these verbs along the parameters of causal patient complicity, sentiment, and register.

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Chapter 1: Introduction

The aim of this study is to probe the differences in meaning of English change of state and causative verbs as reflected in the distribution of their complements. The approach combines intuitions about meaning distinctions in context of use with preliminary diagnostic tools for various parameters and semantic features described herein. In particular, I examine collocational patterns for evidence bearing on several varieties and subspecies of causation, along with pragmatic and social meaning components – specifically sentiment and register – that are potentially encoded in a number of English verbs like cause and become.

1.1 PREDICATE DECOMPOSITION

It is common practice in the syntactic and argument-structure motivated traditions of lexical semantic research to represent predicate meaning with putatively primitive operators in an event structure. For many predicates, these event structures are enriched by the insertion of verb-specific elements of meaning (see e.g. Rappaport Hovav and Levin, 1998). The general approach is illustrated here for 'get':

(1) 'John got angry'
[BECOME [John < ANGRY >]]
get: [BECOME [x <STATE>]]

The sentence 'John got angry' is represented as the event of the state of John being angry (in some referential metalanguage with the "angry" state defined via, e.g., sets of

individuals in possible worlds) "coming about." This "coming about" relation is represented by the BECOME operator. When the verb 'get' (ignoring tense) is abstracted from the logical form, the BECOME operator relating an individual and state is its contribution to meaning[1].

Benefits of this representation include its ability to account for entailment relations (2) and scope ambiguities (3), as well as providing a simple and intuitive framework for the investigation of various alternations (4):

(2) a. 'John made Bill shut the door'
→ 'Bill shut the door' → 'The door shut'

b. [John CAUSE [Bill CAUSE [BECOME [the-door < SHUT >]]]]
→ [Bill CAUSE [BECOME [the-door < SHUT >]]]
→ [BECOME [the-door < SHUT >]]
→ [the-door < SHUT >]

(3) 'John shut the door again'
(again)[John CAUSE [BECOME [the-door < SHUT >]]]
[John CAUSE [BECOME (again) [the-door < SHUT >]]]

(4) Causative: [John CAUSE [BECOME [the-door < SHUT >]]]
Inchoative: [BECOME [the-door < SHUT >]]
Stative: [the-door < SHUT >]

[1] Lambdas and types are omitted here for perspicuity.

In (2), the entailment of Bill shutting the door generated by the sentence 'John made Bill shut the door,' and the entailment of the event of the door becoming shut, as well as the consequence of the door then being in the state of being shut, are all captured as a nested embedding of substructures corresponding the sub-events encoded by the sentence. In (3), the so-called 'repetitive' versus 'restitutive' readings (Beck & Snyder 2001) of 'John shut the door' – the former the case in which John had shut the door at some time prior to the reference time, and the latter being that in which the door had at some time prior to the reference time been shut – is represented via a scope ambiguity. And in (4) the causative and inchoative as well as the inchoative and stative alternations are related in terms of event complexity, which is iconically represented by predicate decomposition.

Despite these virtues, some researchers have questioned the adequacy of decompositions as comprehensive models of verb meaning (see Pulman 2005 for discussion) and they remain controversial. One potentially illuminating test of the sufficiency of these decompositions is the behavior of verbs whose meaning should consist of nothing outside of event structure scaffolding and primes according to event-structure models of predicates[2], without 'manner' or other commonly proposed idiosyncratic semantic components. If these verbs differ from one another in their use, it could indicate encoded semantic, pragmatic, or social meaning differences beyond that suggested by standard decompositional analyses. These event scaffold verbs, which include simple change of state verbs like *become*, *go* (bad), and *turn* (red) and periphrastic (or analytic, or syntactic) causatives such as *cause*, *make*, and *get* (him/her

[2] At least insofar as it is claimed that *Bill shut the door* → *Bill made/caused/forced… the door shut*.

angry) might be called "semantically primitive" in keeping with the semantic primes populating the literature of decompositional verb meaning.

1.2 SELECTIONAL RESTRICTIONS AND VERB MEANING

An examination of the verbs under investigation reveals clear differences in what kinds of complements are felicitous for certain verbs and what kinds are disallowed:

(5)	a.	It became apparent	a'.	*It got apparent
	b.	John got taller	b'.	*John came taller
	c.	It came true	c'.	*It went true
	e.	He went nuts	e'.	?He became nuts
	f.	It got John interested	f'.	*It drove John interested
	g.	It drove Sara crazy	g'.	*It let Sara crazy
	h.	Mike let the car rust	h'.	*Mike set the car (to) rust
	i.	He set the bird free	i'.	?He got the bird free[3]

Here, a motivating hypothesis is that differences in complement classes are reflections of differences in meaning among these verbs[4] that are not represented in event-structural analyses. The present study is an examination of these possible meaning differences and an attempt to develop criteria for their expression and selection properties.

The report is organized as follows: In chapter 2, the behavior of causative verbs is examined and insights from natural semantic metalanguage and force-dynamic

[3] This sentence is felicitous with a specific 'untangle' meaning.

[4] *Pace* Jackendoff (1990, 151), "…the lexical causative may include idiosyncratic information as a modifier of the CS-function or as selectional restrictions on its arguments; such lexically specific information is not available with a general periphrastic causative."

approaches to causation are considered as a means to distinguish periphrastic causatives based on the semantic features of causal proximity and patient complicity. In chapter 3, a simple approach to sentiment analysis is pursued and attempts are made to identify verbs of becoming and causatives that encode the evaluative stance of the speaker toward the resultant state or caused subevent. Chapter 4 briefly examines register as a further parameter of variation and chapter 5 concludes.

Chapter 2: Types of Causation

A periphrastic causative is understood here as a verb that "controls a non-finite complement clause and [whose constructions] express a causal relation in which the occurrence of the effect is entailed" (Gilquin 2010, 1)[5]. The precise nature of causation, or of a "causal relation," is not entirely straightforward or easily expressible. One of the more appealing and often repeated definitions of causation is the counterfactual (Stalnaker 1968; Lewis 1973): X caused Y if Y would not have occurred if not for X. This can be restricted, and absurdities of distance and time avoided, by appealing to causal chains[6] and minimal differences between possible worlds (see, e.g., discussion in Dowty 1979). Although this perspective is far from transparent or unproblematic (for example, it is not always clear which, if any, world with some particular sufficient condition omitted is less different from the actual one than the worlds with some other omitted[7]), counter-factuality will be adopted here as a conceptual heuristic for causation[8]. In particular, the counterfactual notion can be incorporated into a semantic acceptability

[5] But see footnote 8.

[6] Or, equivalently, a series of Dowty's (1979, 108) "causal factors."

[7] Lewis acknowledges the difficulty of this problem: "…the vagueness of over-all similarity will not be entirely resolved. Nor should it be. The vagueness of similarity does infect causation, and no correct analysis can deny it." (Lewis 1973, 560).

[8] Although much of the following discussion will assume that causation is a relation between an individual and a proposition, rather than between propositions, events, or individuals and events, this assumption is not crucial and the approach is compatible with the other formulations.

judgment by identifying core[9] periphrastic causatives by result entailment and consequent generation of contradiction when the resultant state or event is negated:

(6) a. #The blast caused the boat to heel, but the boat didn't heel.
b. #John made Bill leave, but Bill didn't leave.
c. Mary begged Bob to marry her, but he didn't marry her.

(adapted from Wolff and Song 2003, 286)

Based on that criterion, the causatives examined here include *cause*, *get*, *force*, *make*, *turn*, *set*, *drive*, and *have*, plus the exceptional *let* and *allow*. Verbs not considered, which are causative but are restricted or specialized in some way, include *persuade*, *convince*, *wreak* (havoc, destruction), *bring about*, *give rise*, *induce*, and *render*.[10]

Causation as it is expressed in natural language is not uniform. In particular, English periphrastic causatives are not typically substitutable without an alteration of meaning, even when such a substitution results in an acceptable sentence:

(7) a. She had him mail the letter.
b. She got him to mail the letter.
c. She made him mail the letter.

Intuitively, the sentences in (7) – in addition to whatever other meaning differences are present – represent points on a potential continuum with respect to how cooperative the patient is in mailing the letter, with (7a) corresponding to the most cooperative and (7c) the least. In each case, the subject "causes" the patient to mail the letter, but there is

[9] Included exceptions are the let/allow causative types with sentient patients: "She let him leave, but he didn't leave" (Wolff and Song 2003, 286).
[10] *Lead* and *compel*, neglected here in the interest of space, will be treated in future work on the subject.

nevertheless a difference in terms of how much (perhaps patient-internal) resistance must be overcome to do so. In the following subsection, intuitions regarding meaning differences are explored within Talmy's (1988, 2000) force-dynamic model of causation. These intuitions are further explored and refined in section 2.2 by appealing to the framework of Natural Semantic Metalanguage, and finally they are interpreted in terms of the semantic parameters of causal proximity and patient complicity.

2.1 FORCE DYNAMICS AND CAUSATION

In the domain of cognitive semantics, Leonard Talmy's (1988, 2000) treatment of 'force dynamics' has been influential as a tool for the analysis of causation. In his presentation of conceptual force dynamics, Talmy (2000) identifies the primary conceptual-semantic elements as an agonist (causee) and antagonist (causer). Each has an intrinsic force tendency – either toward motion or rest – and there is a resulting balance of strengths, with either the agonist or antagonist as the stronger entity. Together, these result in a force interaction outcome of either motion or rest (Talmy 2000, 414). This allows him to model not only the causative scenario in terms of physical forces, but also to similarly model the notions of prevention and enablement.

According to Talmy's models, *make*, *force*, *get*, and *have* are all examples of 'effectuating' causation, in which the antagonist exerts a more powerful force on the agonist than vice-versa, resulting in motion in the direction of the intrinsic force tendency of the antagonist. The verbs *make* and *force* differ from *get* and *have* in whether the

agonist's intrinsic force tendency is in the opposite direction of the antagonist's (for *make* and *force*) or toward rest (for *get* and *have*). The co-categorical pairs might then differ in the strength of their agonist – to my intuition, then, the agonist of *force* is stronger than that of *make* and the agonist of *get* stronger than *have*[11], but in all cases it is ultimately weaker than the antagonist and therefore subject to the direction of its inherent force tendency.

Contrasting with these effectuating causative verbs are the enabling causatives like *let* and *allow*. For these verbs, the causer does not necessarily exert a force on the causee, but rather removes an impediment – whether that be the causer itself or some other entity – to the causee's desired action or state. The distinction is illustrated by the following different depictions of a water-draining event:

(8) a. The piston squeezing down (made the water drain/drained the water) from the tank.

b. *The plug coming loose (made the water drain/drained the water) from the tank.

c. The plug coming loose (let/allowed) the water (to) drain from the tank.

(Talmy 2000, 505)

In (8a), an external device exerts a pressure on the patient (the water), which pushes it through the drain. Since this is an example of effectuating causation (a strong antagonist acting on a weaker agonist), the *make* and the lexical causative patterns are appropriate. In (8b), however, the event of the plug coming loose does not represent the exertion of a

[11] See II.iii and II.iv below for some motivation, supporting evidence, and systematization of these intuitions.

force on the water, but rather the removal of a force (the seal) that was preventing the desired/intrinsic result of the patient (downward motion). This satisfies the counterfactual definition of causation – the water would not have drained from the tank if not for the loosening of the plug – but introduces an additional participant that the causer must act on to bring about the result state.

In the case of human causer and causee of enabling causation, the verbs *let* and *allow* represent an authority that removes an (often unstated and social) obstacle, which frees the causee to exercise her will. These behaviors are reflected in the verbs' use[12]:

(9) a. "Let the meat rest 20 to 30 minutes after cooking to let the juices settle in the meat." (Washington Post 1990)

b. "Please let me stay. I'll behave. No profanity. I swear." (Esquire, 1998)

c. "I let my kids decorate their rooms any way they want." (Parenting, 1999)

In (9a), there are two instances of *let*, each with an inanimate patient. In each case, the complement of the verb describes the natural tendency of the patient – if undisturbed, meat will 'rest' and juices will 'settle' – so *let* seems to mean 'remove (or don't create) any obstacles.' In (9b), the speaker is pleading for the addressee to remove what is likely a force, probably implied, toward his or her removal, and in (9c) a parent describes the removal or non-enforcement of what might otherwise be considered a normatively default rule governing child behavior. In each case, the cause is an instance of removal of (or non-creation on the part of an authority to create) an impediment on – to use force-dynamic terminology – the 'agonist's intrinsic force.'

[12] All collocation data and example sentences where not otherwise cited are from the Corpus of Contemporary American English (COCA), maintained by Mark Davies at Brigham Young University.

2.2 CAUSAL DISTINCTIONS AND NATURAL SEMANTIC METALANGUAGE

Wierzbicka (1998) models the differences between the effectuating causative verbs *have*, *get*, *make*, and *force* in terms of short lists detailing the conditions and role bearer attitudes that she claims make each verb felicitous in context. Her approach is lexically idiosyncratic and, in general, she rejects the notion that there exist a priori types of causation that are represented by the English periphrastic causatives (Wierzbicka 1998, 117). In this section, I posit some preliminary descriptive observations and provide corpus sentence examples to introduce and motivate her Natural Semantic Metalanguage approach to the particular verbs of interest here, beginning with causative *have*.

The causative verb *have*, as in (7a) above, "She had him mail the letter," seems to occur most felicitously with animate, agentive patients. In the cases for which it does not, as for sentences containing passive participles like "he had his car fixed," an unexpressed agent who did the action leading to the state expressed is understood. The verb does not select for an animate or animate-like patient if it is conceived as non-agentive or somehow unwilling. For example, "?She had the cat drink the milk," or "??He had the washing machine wash the clothes." Wierzbicka recognizes this feature of causative *have* and claims that use of the verb suggests a hierarchical relationship, but not one in which the causer has unlimited power over the causee, but rather the causee is "a cooperative performer of the causer's will" (Wierzbicka 1998, 121). She represents the have predicate with the following scenario outline:

(10) Person X had Person Y do Z =

a. X wanted Z to happen (to W)

b. because of this X wanted Y to do Z (to W)

c. because of this, X said something to someone

d. because of this Y did Z

e. X could think that when X says something like this (about something like this) Y can't say: "I don't want to do this" (Wierzbicka 1998, 120)

The causative verb *get*, on the other hand, suggests cooperation of a less enthusiastic sort. Like *have*, when *get* occurs with a human patient it signals compliance, but does not require that the patient be interested specifically in performing the causee's will. Similarly, there is no necessary power or authority that the causer has over the causee, rather the causer must do something that somehow influences the causee's desires and behavior. In general, the requirement that the causer simply wants the causee to do something is insufficient for *get* causation. This is presumably the reason for the somewhat manipulative tone that often accompanies these constructions, as in a sentence like "he cleverly got the suspect to admit his involvement in the crime." *Get* can also take nonhuman complements, as in "I got the cat to drink the milk," with the implication that the agent did something to make the animal want to, or otherwise be willing to, perform the desired action. With *get*, the patient has the right of refusal and is operating according to its own will. Sentences in the corpus are consistent with these intuitions, as the examples in (11) suggest:

(11) a. "…that's the best way to get them to come forward." (CNN – AM, 2006)

b. "…a number of us have been trying for years to get the government to

recognize it." (PBS Newshour, 1990)

Wierzbicka represents the behavior of *get* as follows:

(12) Person X got person Y to do Z =

a. X wanted Y to do Z

b. X knew that if Y didn't want to do it Y would not do it

c. X thought that if Y wanted to do it Y would do it

d. because of this X did (said) something to Y

e. because of this after this Y wanted to do Z

f. because of this Y did Z

g. because of this X could think: "I wanted something to happen. It happened" (Wierzbicka 1998, 124)

The cases for which the patient is inanimate, as in "I got the car running," or, to borrow Wierzbicka's example, "I got the sauce to thicken" (1998, 123), likely represent a metaphoric extension of this scenario. In most such cases, the patient, though inanimate, is conceived as having some volitional property, and in particular a stubbornness, which must be manipulated or overcome[13]. This is reflected in the oddness of *get* when it occurs outside of a context of effort or resistance, as in context-neutral "I got the book open."[14]

[13] A possible exception is the idiom "get the ball rolling," for which resistance is not obvious. Part of the meaning of this idiom plausibly relies on a relative difficulty of initiating some process, which would accord with the generalization given, but this is not straightforward.

[14] There is a usage of 'get' that occurs in sentences like "I just need to get my shoes on and I'll be ready to go". These present a challenge for the generalization made here. One possible analyses of these usages might claim that in sentences of this type something (a task) is preventing or delaying a desired outcome, which might then invest the task with a sort of figurative resistance and thereby make 'get' felicitous, but the details of such a proposal are not yet clear to me. My thanks to Steve Wechsler for pointing out these constructions.

There are several distinctive uses of the verb *make*, differing both in terms of verb complement and subject properties. Typical corpus sentences containing causative *make* and animate patients include the following:

(13) a. "When they were far enough away not to make the strange horses nervous…"[15] (Analog, 2000)

b. "I wanted to make her feel better." (US Catholic, 1998)

Common to sentences of this type is the emotional or otherwise cognitive nature of the caused event or state. For these *make* constructions, Wierzbicka offers the following explication:

(14) Person X made person Y think/feel/want something =

a. X did something

b. because of this Y thought something

(b' because if this Y felt something)

(b'' because of this Y wanted something)

c. Y wouldn't have thought/felt/wanted this if X had not done this

(Wierzbicka 1998, 130-134)

Another *make* causation construction type is that for which the verb 'do' or another action verb occurs in the complement clause:

(15) a. "I'll make you dig the most." (Bk: Salem Falls, 2002)

b. "It may make him pay for the actual harm caused by…"

(EnvirAffairs, 1998)

[15] Although here the collocate 'nervous' is an adjective rather than a verb, and adjectival collocates were not collected for causative verbs in this study, the generalization that animate complements of *make* select for cognitive features, discussed below, seems to hold for this example. In any case, I presume the relevant details are consistent with an elided verb 'feel' preceding the adjective.

For these sentences, which I will call 'make do' constructions, there is a coercive reading resulting from a power differential, which Wierzbicka represents as in (16):

(16) Person X made person Y do Z =

a. X wanted Y to do Z

b. Y knew this

c. X knew that if X didn't do something to Y, Y wouldn't do I"

d. because of this X did (said) something to Y

e. because of this, Y thought "I have to do it"

f. because of this Y did Z

g. Y wouldn't have done Z (at that time) if Y had not thought this (ibid 136)

For the 'make do' pattern, the right of refusal present in *get* is absent or diminished. Substitution of *make* in a sentence like "I tried to get him to do it, but he refused" – "?I tried to make him do it, but he refused" – is less felicitous.

The causer of a 'make do' construction need not be agentive. Non-agentive causers occur in sentences like "the weather made us cancel the event" or "the noise made the guests leave." This kind of scenario is directly analogous to that depicted in (16), absent only the will of a causer:

(17) Something (X) made person Y do Z =

a. person Y was in place P

b. something (X) happened in P (e.g. it started to rain)

c. because of this Y thought: "I have to do something"

d. because of this Y did Z (go inside)

e. Y wouldn't have done Z if X had not happened (ibid 138)

Finally, the object of a *make* periphrastic causative need not be animate. The significant meaning component in these sentences is made salient when compared to lexical causatives:

(18) a. Henry shattered the window.
b. Henry made the window shatter.

(18b), in contrast with (18a), suggests a kind of indirect causation. While (18a) could describe a scenario in which Henry punched and broke a window, (18b) would be inappropriate in such a context. Make-do causatives of this kind are most felicitous when something happens due to some action, but nothing is done directly to the patient, with an oftentimes-unexpected result:

(19) Person X made Z happen to thing Y (e.g., open, go off)
a. X did something
b. because of this something (Z) happened to thing Y
c. Z wouldn't have happened to Y if X had not done this
d. X didn't do anything to Y
e. because of this people could think that Z would not happen to Y

(ibid 147)

This, however, does not seem to be the whole story as concerns the make-do causative construction. The causative is also felicitous when the means of causation are unknown or otherwise unexpressed:

(20) "Who can make the disc soar highest, furthest, or longest?" (ChildDigest, 1998)

Taken together, then, the periphrastic causative *make* requires the internal (if animate), indirect, or unspecified compulsion of a patient.

Force, finally, encodes direct compulsion. The patient of a *force* causative is non-cooperative, but has no right of refusal, and causation is typically direct. In the case of inanimate patients, the distinction is again highlighted when compared to the lexical causative:

(21) a. Bill opened the door.
b. Bill forced the door open.

In (21b), there is an implication of resistance that is not present for (21a): "#Bill forced the door, which easily relented, open." The pattern is extended for animate patients, for whom the resistance is often internal – emotional or cognitive.

(22) a. "…dry leaves will inevitably lead to huge fires, forcing displacement of deer, elk, and upland birds…" (FieldStream, 2007)
b. "…a new military campaign to force Muslims from their homes and villages…" (ABC_Jennings, 1993)
c. "The court forced the district to integrate." (DenverNews, 2010)

The resistance of the causee and the control of the causer are likewise represented in Wierzbicka's explication:

(23) Person X forced person Y to do Z (e.g. to apologize). =
a. X wanted Y to do Z
b. X knew that Y didn't want to do Z
c. X thought that if X did something to Y, Y would have to do Z
d. because of this X did something to Y
e. because of this Y had to do Z

f. because of this Y did Z

g. Y wouldn't have done Z if X had not done this to Y

h. when Y was doing Z, Y thought: "I don't want to do this"

(ibid 141)

In the following sections, the approaches of Talmy and Wierzbicka to causation in English periphrastic verbs will be compared to corpus collocation data and ultimately rejected in favor of a somewhat hybridized view.

2.3 CAUSATIVES IN THE COCA

To collect data bearing on the selection biases of periphrastic causatives and verbs of becoming, I performed a search of right collocates of the verbs in the Corpus of Contemporary American English (COCA). The COCA is a 450 million word balanced corpus, equally divided among spoken, fiction, popular magazines, news texts, and academic publications, as well as by year for each year from 1990-2012 (http://corpus.byu.edu/ coca/). The data presented here were obtained by searching for verb lemmas following 'X me|him|it (to)' for causative verbs or adjective lemmas immediately following the verbs of becoming. For each verb, the five most frequent verb lemmas were added to a list (the horizontal x-axis in the graphs below), and the frequencies for each member of that list were collected for each causative or inchoative verb, allowing for a stable comparison set of collocates for the verbs of interest. The vertical y-axes of the graphs represent the frequency of occurrence for each word on the x-axis as a percentage of all words of that part of speech (in this case, lemmatized verbs)

occurring in that environment. The results of this procedure for the causative verbs are presented in this subsection.

As discussed in section 2.2 above, causative *get* suggests patient cooperation that is somewhat more resistant than that of patients of causative *have*[16]. *Get* with an animate patient requires that the causer do something to influence the causee's will, but she has no direct authority or power. The patient has the right to refuse the agent's desires, as suggested by the sentences in (11), repeated here as (24):

(24) a. "…that's the best way to get them to come forward." (CNN – AM, 2006)

b. "…a number of us have been trying for years to get the government to recognize it." (PBS Newshour, 1990)

Also suggestive is the distribution of verbs that appear in the complements of *get*:

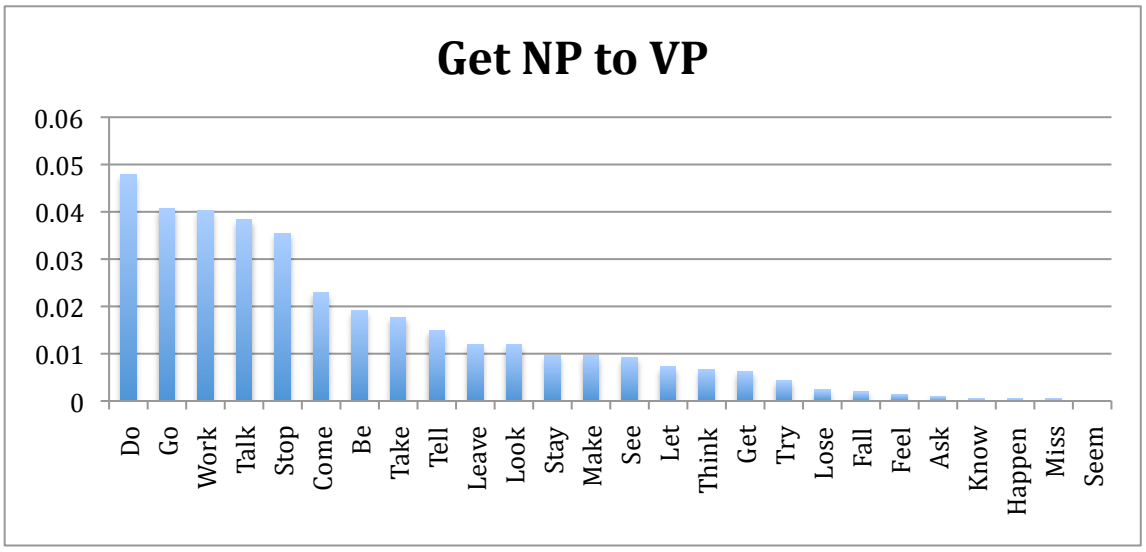

Figure 1: distribution of representative verbs occurring in the complement clause of *get*.

[16] Rampant polysemy makes corpus data collection for causative *have* infeasible. However, I hope that the stereotypical employee/employer relationship that is evoked by sentences like "she had him fax the letter," which seems to combine a cooperative patient with a possible power differential, makes the relevant semantic features of this verb relatively noncontroversial.

The most frequent verbs, such as *work*, *do*, *talk*, *stop*, *come*, and *go*, all require the volition of the subject when it is animate, whereas non-volitional verbs like *seem*, *know*, and *feel* are comparatively rare. While someone can refuse to do something, she cannot similarly refuse to know something. This supports the claim made in the previous section that *get* causation with an animate patient involves influencing the patient's will, which appears to be a fundamental feature of the meaning of causative *get*.

The periphrastic causative *make*, in contrast to *get*, commonly occurs with verbs of emotion and cognition:

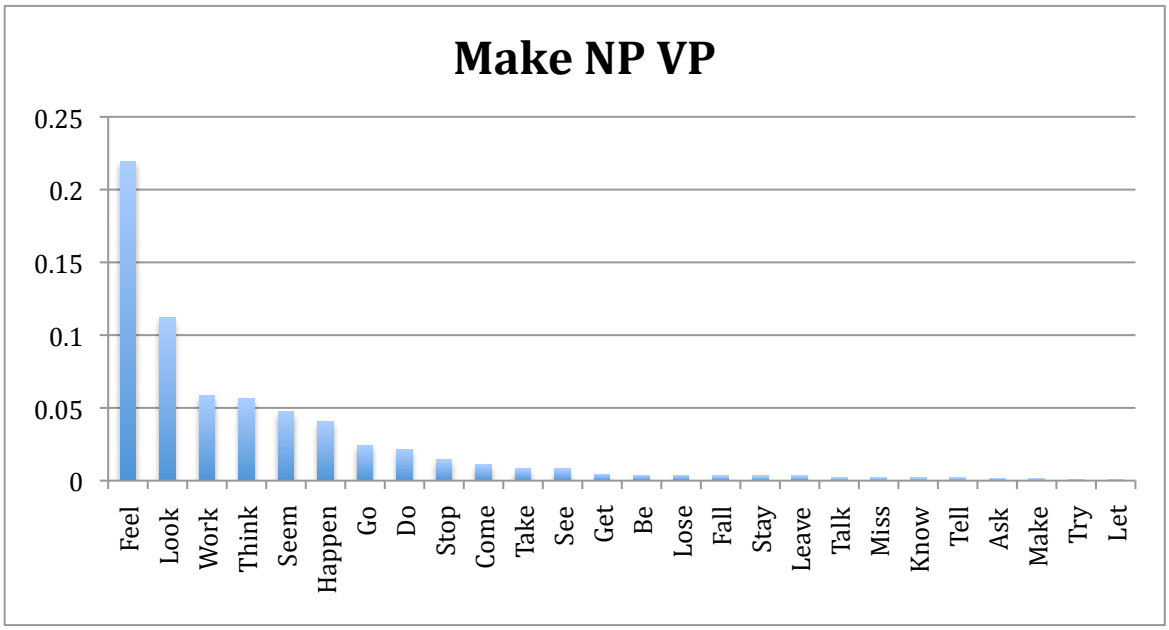

Figure 2: distribution of representative verbs occurring in the complement clause of *make*.

The most common verb in a complement clause of *make* is *feel*. Feeling, like thinking and seeming, is not necessarily volitional on the part of the patient, insofar as it is a

cognitive state that is potentially unwilled. Like *get*, then, the collocation frequencies are consistent with the claim that *make* is sensitive to the degree of volitional control that the patient can exercise over the event described.

Force, as argued in 2.2, denotes direct causation acting on a non-cooperative patient. Since direct, coercive causation requires volitional control from without, verbs in complement clauses representing cognitive or emotional states, like *feel* and *think*, are comparatively rare, and non-intentional stative verbs like *seem* and *know* are practically absent:

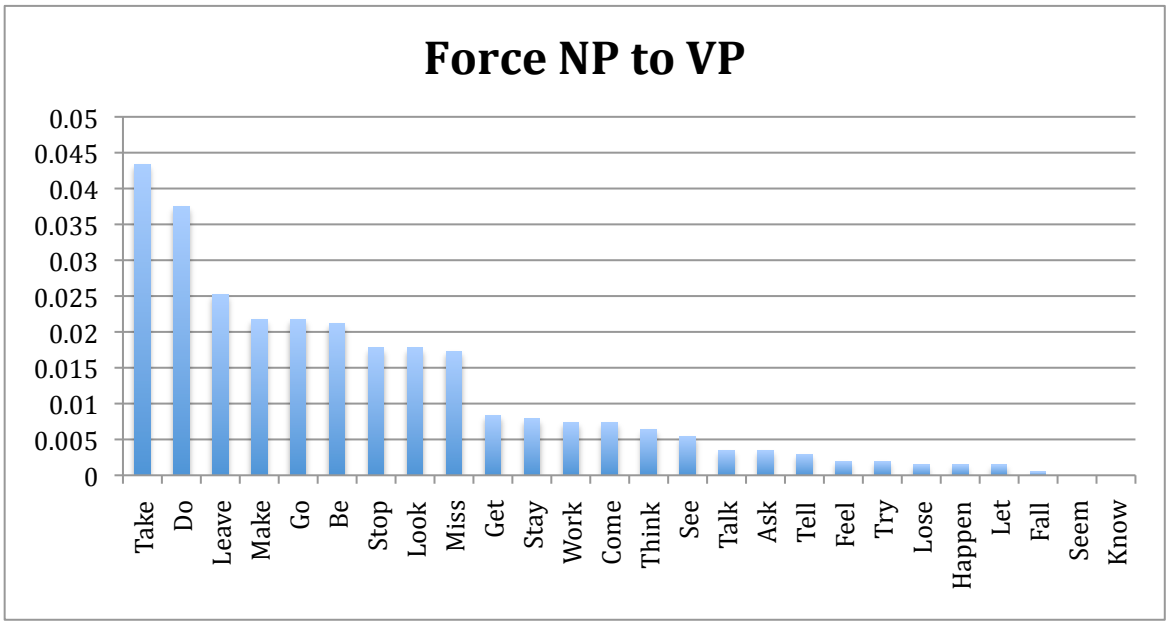

Figure 3: distribution of representative verbs occurring in the complement clause of *force*.

As described in 2.1, the effectuating causatives like *get*, *make*, and *force* differ from the enabling causatives like *let* and *allow*. The enabling causatives involve the

removal of an obstacle and so the causer does not oppose the will or tendency of the causee. But *let* and *allow* also seem to have an extended meaning rooted in politeness. It appears that these verbs signal respect by suggesting that the addressee has the social authority or status to impede the activity denoted by the complement clause. This might be the source of expressions like 'let me ask,' which is typically followed immediately by the question the speaker intended to pose:

(25) a. "All right, let me go back to the question of the budget…" (ABC_Brinkley, 1996)

b. "Let me bring you back in this conversation" (NPR_Saturday, 2002)

c. "Let me just touch on the rest of the story" (NPR_TalkNation, 2007)

There is also a metaphoric construction involving knowledge, in which the addressee is expected to have some information and the speaker asks her to abstain from withholding it by requesting of her to 'let me know:'

(26) "I tried to let him know how important he was." (SportingNews, 2009)

These constructions are so common, in fact, that they are dominantly represented in the complement clause distribution:

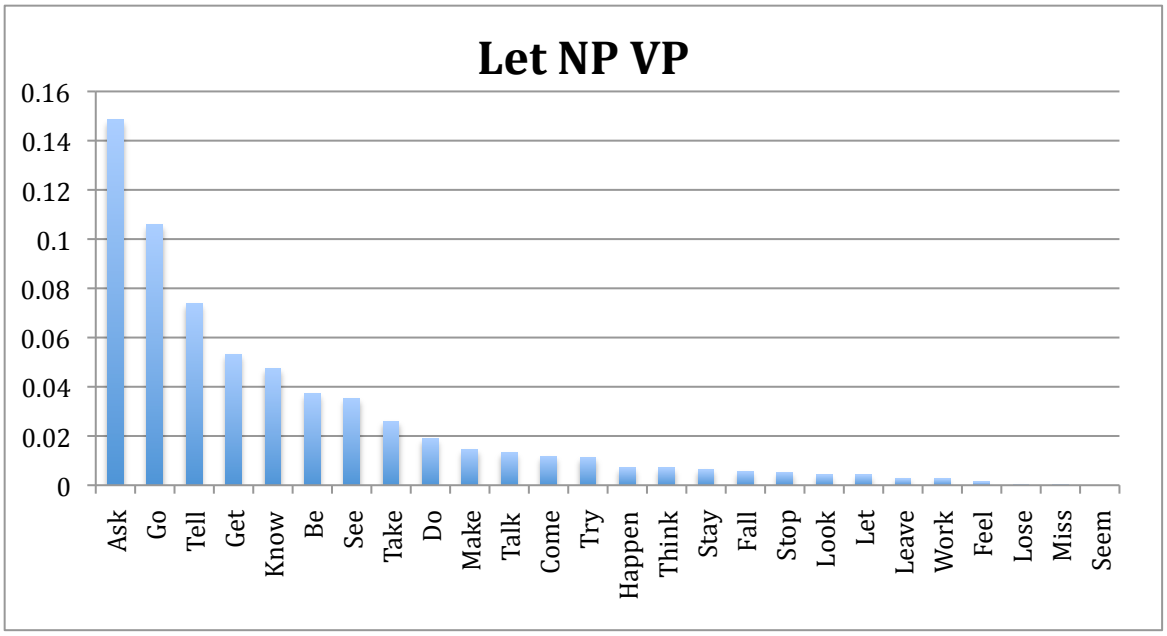

Figure 4: distribution of representative verbs occurring in the complement clause of *let*.

There is yet another type of causation encoded by an English periphrastic causative not yet discussed to this point. This type combines both an initial effectuation followed by a kind of self-agency on the part of the patient. It is expressed by the verb *set* as it occurs in the following kinds of sentences:

(27) a. Bob set the bird free.
b. Bob set the log on fire.
c. Bob set the alarm clock to go off at 6:00 am.

Set, like *make* and *force*, requires some kind of direct action or effectuating force on the patient, but like *let* and *allow*, there is a subsequent kind of self-agency. Although he does not identify set as encoding that causation type, Talmy does characterize the notion of onset causation, as illustrated in (28):

(28) a. I slid the box across the ice by pushing on it (steadily).
b. I slid the box across the ice by giving it a push. (Talmy 2000, 498)

The difference in interpretation between (28a) and (28b) is in the relative mapping of causing event and resulting event. In (28a), the box moving across the ice is "the ongoing result of an extended force impingement without which it would stop," (Talmy 2000, 498), while in (28b), the motion following the initial push is conceived as autonomous and requiring no further force. Interestingly, events of this type are often described as 'setting (something) in motion,' which reflects the unique causative profile of *set*. The combination of effectuating onset causation and subsequent self-agency can be seen in the sentences below:

(29) a. "She set him to grazing on clover" (Bk:ColdMountain, 1997)
b. "…pathways that are set into motion by the consumption of abused drugs…" (DrugIssues, 2009)
c. "…other houses and barns were set on fire" (SocialHistory, 1993)

In (29a), after an initial (here, perhaps enabling) causative event, the will of the patient sustains the event denoted by the complement clause. In (29b), certain neural pathways, once activated, remain active independent of further external influence, and in (29c), the 'set on fire' phrase describes a situation of an initiating act that is followed by self-sustaining activity – the burning of the fire. The sentence (29c), in which someone sets a device to do something at a later time, demonstrates how this initiation plus self-agentive causative scenario can be conceptualized for complex artifacts.

In the corpus sentences, almost all verbs appearing in the complements of the *set* causatives are activity verbs: *work*, *go*, etc. This tendency is consistent with the characterization that *set* is a direct but also enabling causative of a self-directed activity, and their relatively restricted set of collocate verbs is intriguing, if not yet entirely clear, in its own right:

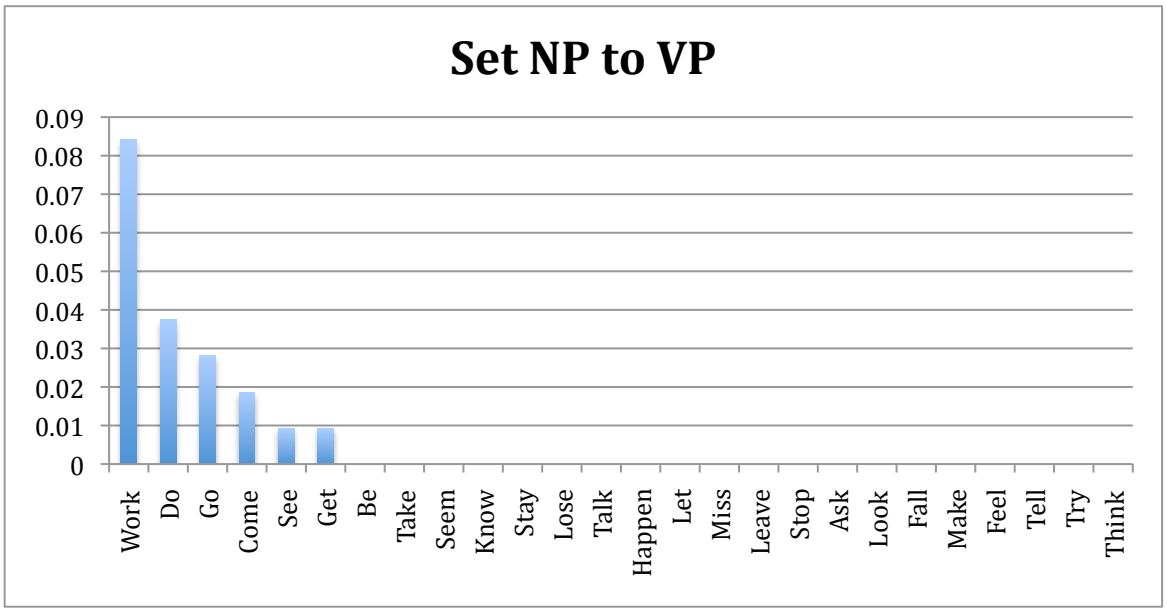

Figure 5: distribution of representative verbs occurring in the complement clause of *set*.

Finally, *drive* denotes an extended effectuating causation that is coextensive with the path leading to the result state. For most sentences containing the periphrastic causative *drive*, the interpretation is the extended application of a (usually unpleasant, see section III) force resulting in an adverse reaction or state:

(30) a. "The smoke drove the squirrel from its tree." (Talmy 2000, 540)

b. "...that despair drove him to violence." (New York Times, 2002)

c. "…your incessant barking is driving me crazy." (NPR_TalkNation, 2009)

d. "Lucifer was driven away from heavenly paradise."[17]

(Scandanavian Studies, 1998)

Like *set*, *drive* is relatively restricted in its collocation patterns, but in addition to physical activity verbs, also co-occurs with cognitive, perceptual, and emotional verbs, such as *see*, *try*, and *think*:

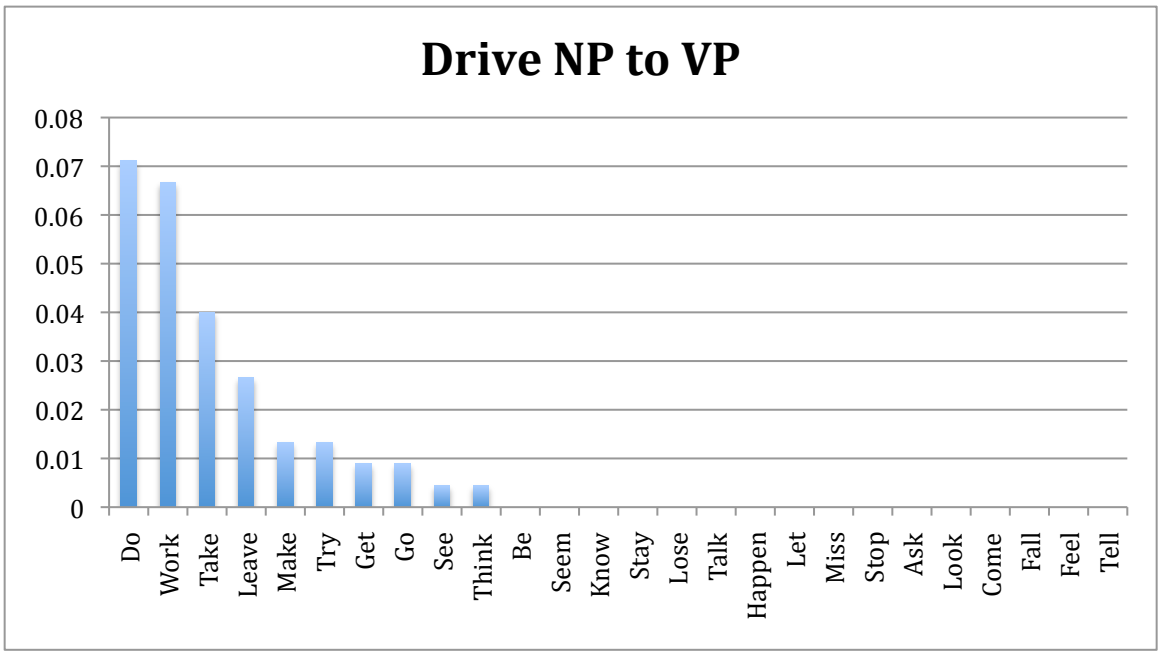

Figure 6: distribution of representative verbs occurring in the complement clause of *drive*.

There are two overarching and interdependent parameters that distinguish the causatives examined in this and previous sections. These parameters, described in the

[17] Here, as in (13), the example collocates are of different grammatical categories than the data that was directly gathered in the study and presented in the graphs. They are used only for illustrative purposes.

following subsection, involve the interaction of desires and intentions of causer and causee. Contra Wierzbicka, then, types of causation as modeled by interactions of opposing forces are independent of, and identifiable in, English periphrastic causatives. Contra Talmy, these oppositions are insufficient characterizations of causation as expressed by these verbs. The remainder of the paper will be, in part, an elaboration of the latter point.

2.4 SUMMARY: CAUSAL PROXIMITY AND PATIENT COMPLICITY

The periphrastic causatives can be distinguished along two related parameters. The first parameter I will call 'causal proximity,' which is a generalized measure of how direct the causation is. For example, *to force* is to do something directly to a resistant patient to arrive at an effect. *To make*, while still involving a resistant patient in the case of human participants, requires only the exercise of authority, but not direct intervention. For inanimate patients, the distinction in causal proximity between *force* and *make* is clear from the intuition that in the sentences "he made/forced the door open," only the former can describe the event of pushing a button in a remote location.

The second causative parameter is patient complicity, which is a measure of how resistant or cooperative the patient is to the caused event. The two measures are not unrelated, since a very resistant patient will require a very proximate causal action to effect a result, but the difference between *have* and *get* is illustrative of the distinction. While both *have* and *get* represent a relatively indirect causative scenario involving

relatively compliant patients, for *have* the patient is a "cooperative performer of the causer's will," while for *get*, the patient is only cooperative insofar as his/her/its 'will' is influenced. Despite this distinction, the relative rankings for the causatives examined here are, with one exception, equivalent, with causal distance aligning with patient complicity. The exception is the verb *set*, for which causation is proximate, but the patient is complicit. The complex, two-part, effectuating plus self-sustaining nature of the species of causation that *set* denotes, however, makes this verb somewhat exceptional. A proposal for the patient complicity hierarchy, which I take to be primary, is given in figure 7 below:

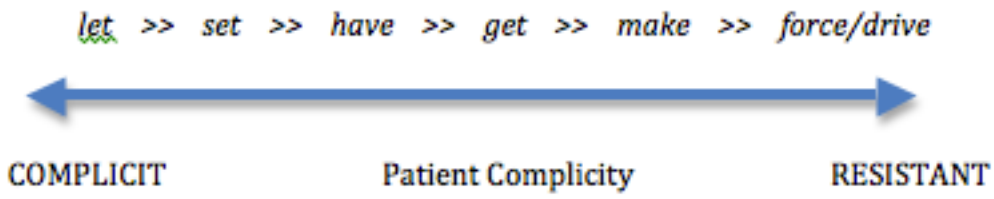

Figure 7: Patient Complicity hierarchy for selected English periphrastic causatives.

The following section extends the search for distinctions among these verbs to the question of how a speaker's attitude toward a subevent or state influences the choice of a verb of becoming or causing.

Chapter 3: Evaluative Polarity

Sentiment plays a role in the meaning of both periphrastic causatives and the 'verbs of becoming' – simple change of state verbs like *become*, *get*, *fall* (asleep), *come* (loose), *go* (crazy), *turn* (sour), and *grow* (tired)[18]. In particular, the choice of a particular causative or simple change of state verb seems to be influenced in part by the speaker's evaluative stance toward the complement clause or result state. The verb *cause*, for example, is best with negative outcomes:

(31) a. Who caused this horrible disaster?
b. ??Who caused this delightful surprise?

To explore whether particular verbs favor positive or negative complements, in this section I apply intuitions regarding evaluative polarity along with a social-media derived measure of sentiment to adjective collocates in corpus sentences and compare those results to binary 'good/bad' collocation preferences as reflected by Google's n-gram resource[19].

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[18] I assume an interval semantics that is common across the verbs of becoming by virtue of encoding changes of state. In particular, the following discussion is compatible with Dowty's "[BECOME ϕ] is true at *I* iff (1) there is an interval *J* containing the initial bound of *I* such that ¬ϕ is true at *J*, (2) there is an interval *K* containing the final bound of *I* such that ϕ is true at *K*, and (3) there is no non-empty interval *I'* such that *I'* ⊂ *I* and conditions (1) and (2) hold for *I'* as well as *I*." (Dowty 1979, 141). What follows is intended to build on this common event structure.

[19] http://books.google.com/ngrams. Note that, Although Google's n-gram measures word-sequence frequencies in books published in English for the last 200 years, to militate against large diachronic changes in meaning, all measures that follow encompass only those books published between 1950 and 2000.

3.1 SENTIMENT AND SELECTION

Much work has been done and many technological advances made in recent years in the area of sentiment analysis. Machine learning and data mining techniques, in particular, have yielded powerful computational resources for the automatic classification of author sentiment in various domains (see e.g. Pang et al. 2002, Pang & Lee 2008, Hatzivassiloglou & McKeown 1997, Kennedy & Inkpen 2006, Blair-Goldensohn et al. 2008). In what follows, however, a somewhat naïve approach to sentiment classification is employed, in which the relative frequencies of right adjacent evaluative adjectives ('good' and 'bad') are compared for the verbs of interest as a means of gauging whether certain verbs have evaluative connotations as reflected solely by their selectional properties.

As mentioned above, the verb *cause* appears to carry a negative connotation that might be unexpected based on its neutral term of art status in disciplines like philosophy and physical science, as well as its use as the name for the semantic primitive in lexical decompositional theories. This tendency is nevertheless reflected in the corpus sentences:

(32) a. "…assess the damage caused by the burning oil wells."
(ABC_Nightline, 1991)

b. "…changes of job and heart had caused some wear and tear on the relationships." (Bk: Romantics, 2008)

c. "The things you didn't do are likely to cause the most regret."
(Prevention, 2006)

d. "Divorce caused tumult, but didn't make a lasting impression, good or bad." (USA Today, 2002)

In (32a), *cause* is used with a state of physical damage and is contrastive with a sentence such as "??...assess the repairs/improvements caused by the workers," in which a positive sentence is no longer felicitous with the verb. In (32b), the physical damage scenario is extended metaphorically to relationship health, and in (32c) *cause* introduces a negative emotional state. (32d) is interesting in that it contains both the *cause* and *make* causative verbs, showing the contrast between the negative 'tumult' complement of the former with the neutral complement of *make*, 'lasting impression,' which is explicitly identified as non-evaluative via a direct denial that it is either good or bad.

When used in some contexts, *cause* can occur with sentiment-neutral complements, as the sentences in (33) demonstrate:

(33) a. "Humidity causes it to curl and turn back." (Atlanta, 2009)
b. "…ultrahigh-frequency sound waves could be used to cause air to bend light." (TechReview, 2002)
c. "Oxidation, the same chemical reaction that causes sliced apples to turn brown."[20] (MensHealth, 1994)

These sentences all involve physical causation without negative connotations. Each provides a physically descriptive, non-evaluative context for which *cause* seems to have a

[20] The evaluative status of *turn* is explored below.

specialized neutral meaning. The frequent verbal collocates of the verb across all COCA contexts, however, include negative terms like *lose*, *miss*, and *fall*:

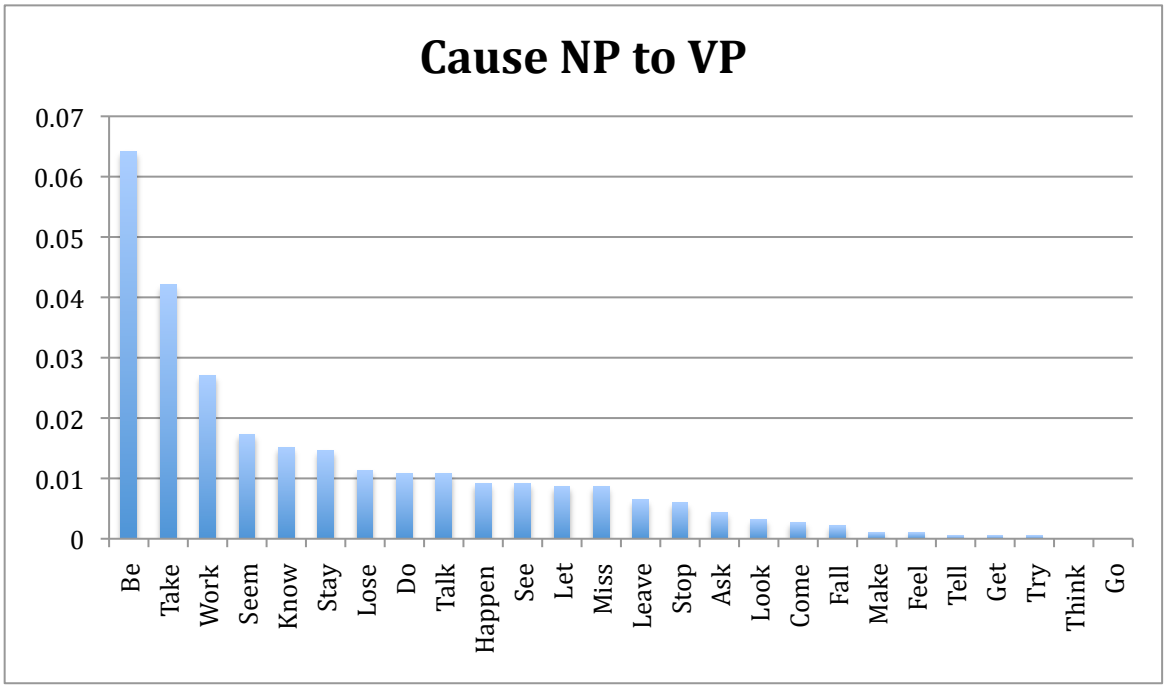

Figure 8: distribution of representative verbs occurring in the complement clause of *cause*.

And in published books the verb occurs more frequently with the clearly negative adjective *bad* than the clearly positive *good*[21]:

[21] Note that here, as elsewhere, Google N-grams evaluates only sequences of words, and not hierarchical syntactic structure reflecting constituency. Most of the 'caused good/bad' tokens likely are the verb with the adjectival modifier of some noun phrase that is not included. One example, from a book published in 1995, is the sentence fragment "six commonly prescribed medications that **caused bad** allergic reactions for me."

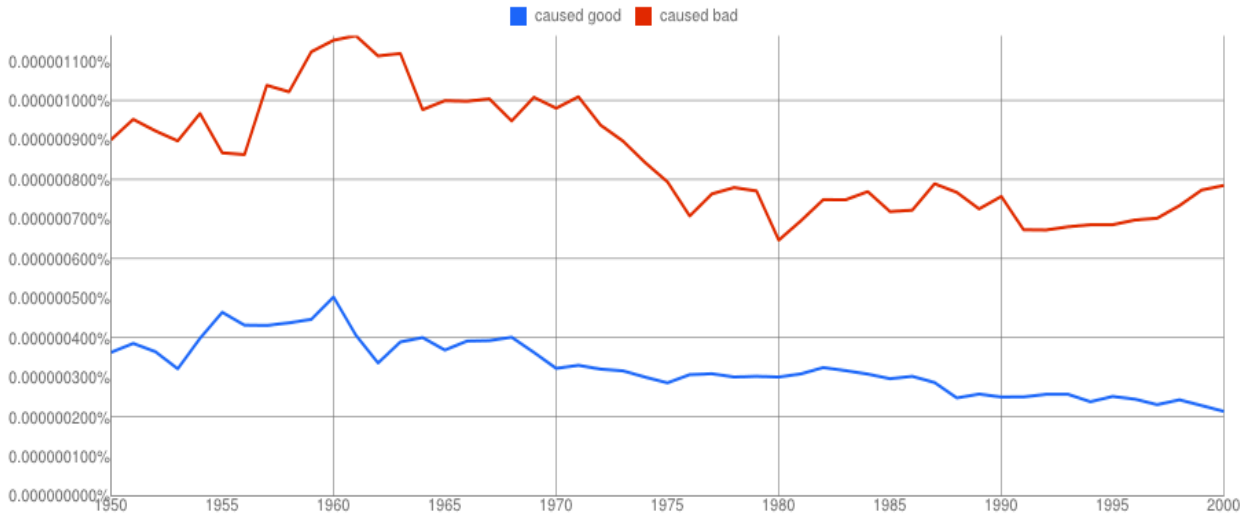

Figure 9: frequency of 'caused good' and 'caused bad' in Google's collection of published books 1950-2000.

One verb for which evaluative status is not robust despite plausible expectations to the contrary is the change of state verb *grow*. According to expectations – in any case, my expectations – *grow* represents a converse of *cause*. In spite of the 'good is up, bad is down' conceptual metaphor (Lakoff & Johnson 1980, 16) and "bigger is better" cultural

values, however, there doesn't seem to be any clear evaluative polarity reflected in the verb's adjectival complements[22]:

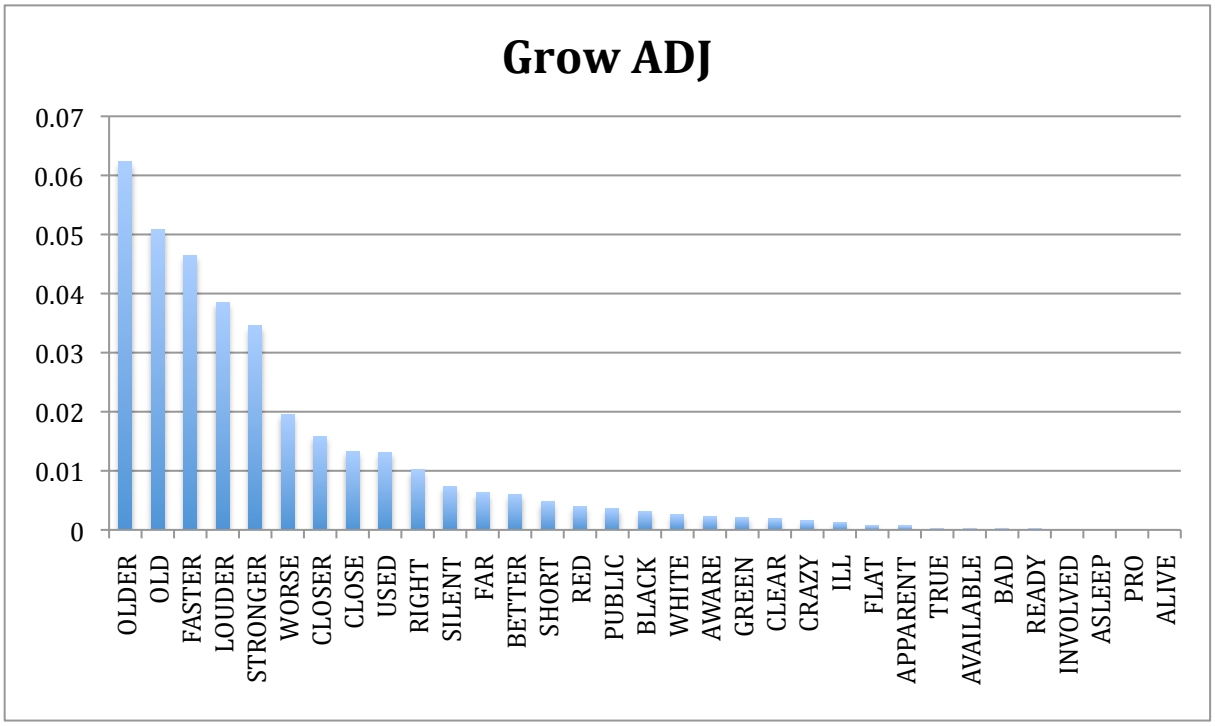

Figure 10: distribution of representative adjectival complements of *grow*.

To employ a more objective – if somewhat crude – measure of sentiment, I obtained a 'positivity measure' for each adjective by dividing the co-occurrence of the word in question and positive emoticons (':)' and its variants) by co-occurrence with negative emoticons (:(-forms) in Twitter data as aggregated by the site topsy.com. Although the

[22] In fact, according to Google N-grams, "grew ill" is more frequent than "grew healthy" in published English books. This is not controlled for word frequency, however, so it is only a suggestive data point if anything.

results do contain anomalies (including the placement of *crazy*, discussed below), it provides an extra-intuitional measure of sentiment. Indeed, the apparent lack of evaluative selection for *grow* is more clearly reflected by the relatively even distribution across the sentiment-ranked x-axis in Figure 11 below:

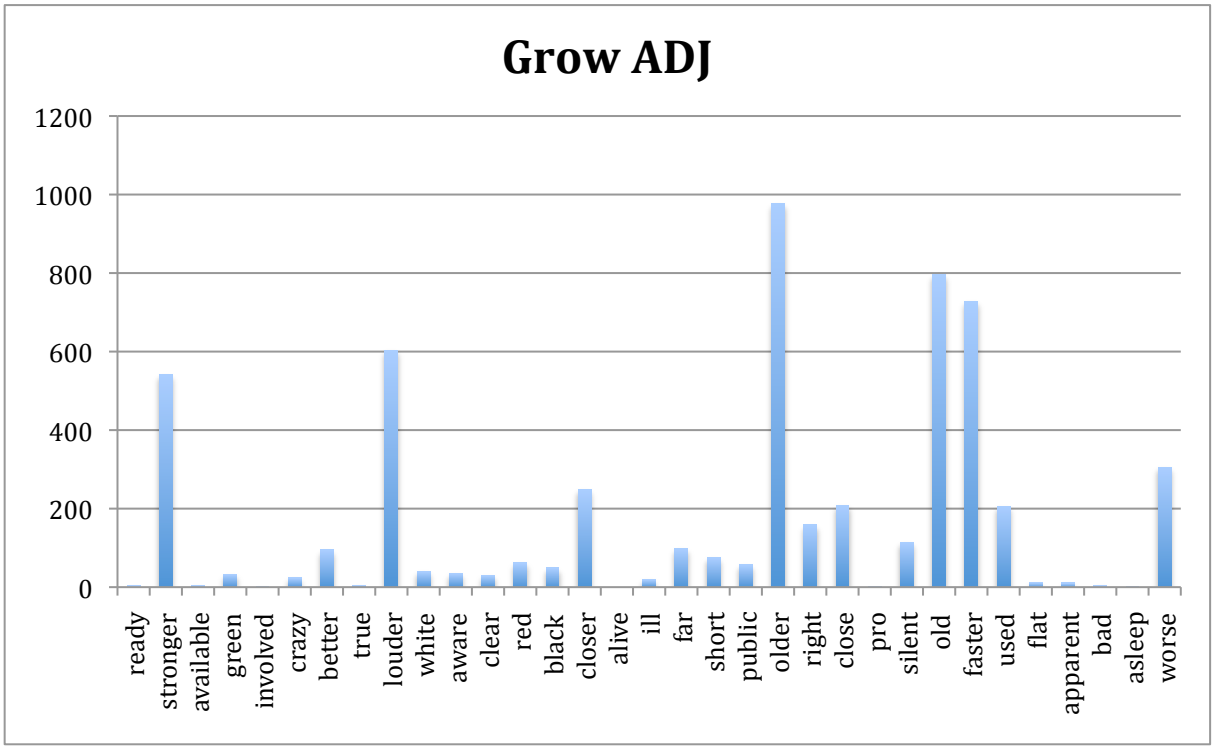

Figure 11: sentiment-adjusted distribution of representative adjectival complements of *grow*.

Based on these data, a characteristic of *grow* more striking than its sentiment selection is its tendency to select for comparative adjectives. Among the most common complements

within this class, *better* and *worse* are both relatively common. Collocation frequencies with *good* and *bad* are practically equivalent[23]:

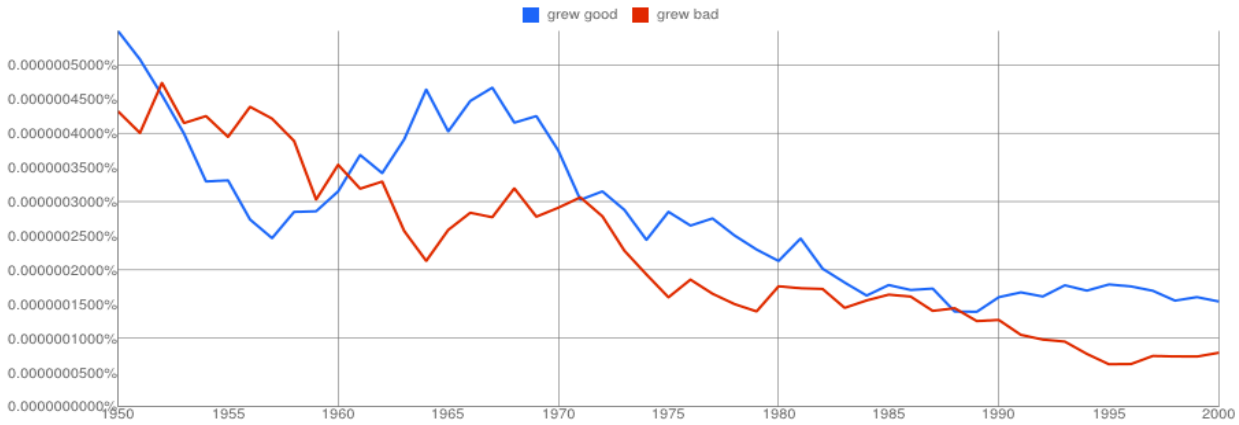

Figure 12: frequency of 'grew good' and 'grew bad' in Google's collection of published books 1950-2000.

The verb *turn* selects for a couple of relatively semantically coherent complement classes that do not display evaluative polarity. Color terms and affiliation categories (especially political or professional affiliation, like "turn pro") are common adjectival complements of the verb of becoming:

(34) a. "A yellow stain will appear or the paper will turn brown and brittle." (AmerArtist, 1998)

b. "…the bird icon turns red and chirps…" (PC World, 2002)

c. "…their shaggy white bark turning pink and gold in the sinking sun." (OutdoorLife 2009)

[23] N-gram results for 'grew better' and 'grew worse' show a slightly higher frequency of the latter consistent with COCA data shown in figure 10, despite the greater overall frequency of the adjective 'better.'

The 'turn X into Y' construction pattern also seems to be neutral with respect to evaluative polarity:

(35) a. "…the ubiquity of cheats has turned clever competitors into couch potatoes." (AssocPress, 2007)

b. "…given them a reason to turn past mistakes into something positive." (Bk: IntoNight, 2011)

c. "The police turned political need into a mandate." (RollingStone, 1993)

While (35a) denotes a presumably negative event of 'turning into,' (35b) is explicitly postive, and for (35c) it is not clear whether there is any sentiment expressed one way or the other. The most common adjectival complements of turn are dominated by color and affiliative category terms[24]:

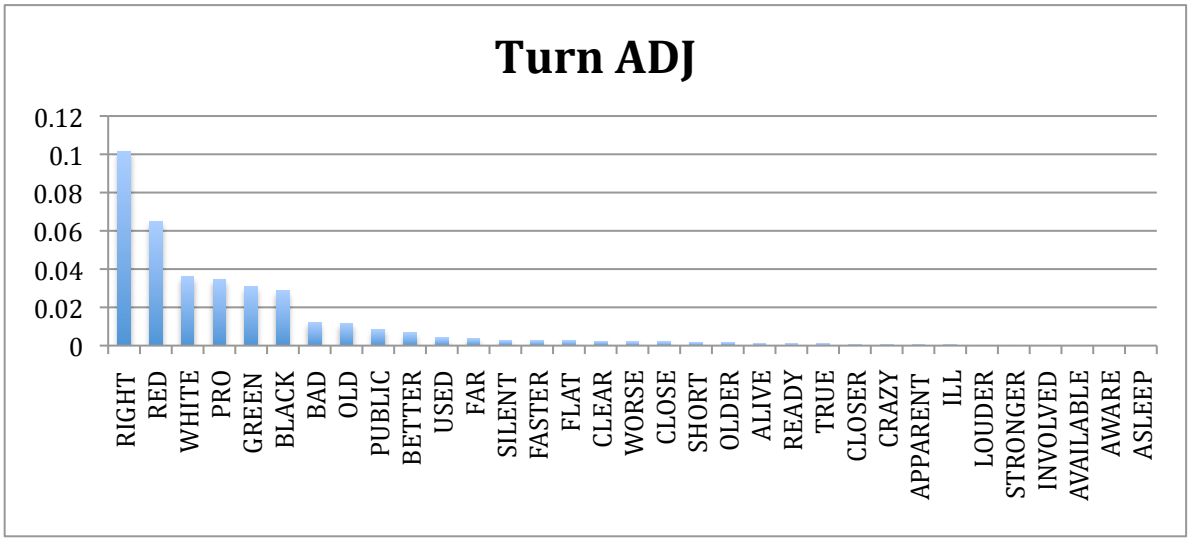

Figure 13: distribution of representative adjectival complements of *turn*.

[24] The presence of the directional motion sense of *turn* results in 'right' being the most common collocate.

But adjectival complements of *turn*, when not a color or affiliative term or a part of a 'X into Y' structure, tend toward the negative side of the sentiment scale:

(36) a. "They turned nasty against the U.N. Human Rights observers." (NPR_America, 1993)

b. "…didn't have a hundred breaths left before his blood turned sour and choked him until he was blue." (FantasySciFi, 2006)

c. "At the movies, Westerns turned dark and cynical." (US_Catholic, 2011)

The sentences in (36a) and (36b) clearly express negative sentiment as reflected by the use of the adjectives *nasty* and *sour*. In (36c), movies becoming dark and cynical might be a good or bad thing depending on one's taste in movies, but considering the source – a religious magazine – a presumably negative sentiment toward the development justifies the use of the verb *turn*. Relative frequencies of 'turned good' and 'turned bad' on Google's n-gram viewer bear the intuition out:

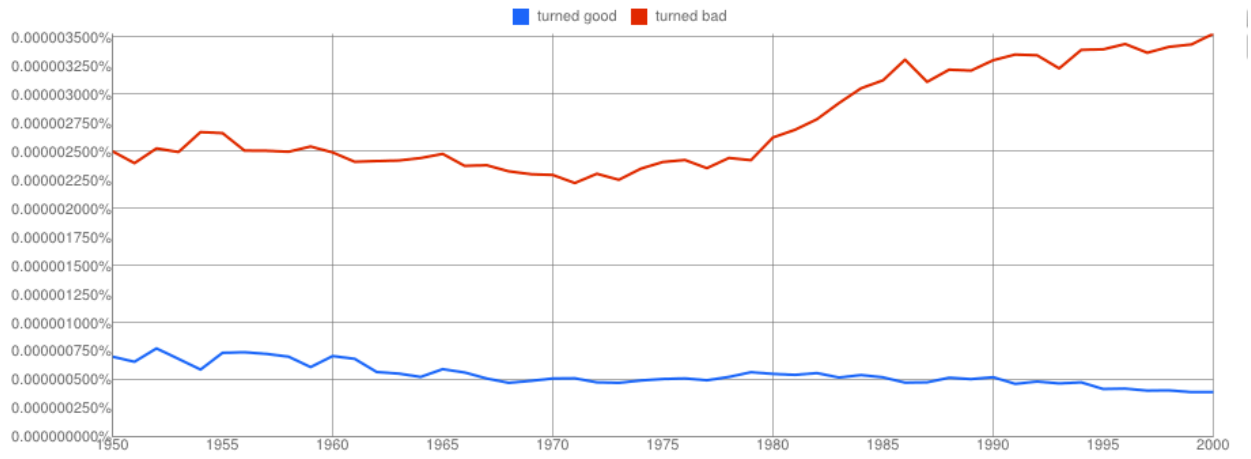

Figure 14: frequency of 'turned good' and 'turned bad' in Google's collection of published books 1950-2000.

The change of state verb *come* appears with a relatively restricted set of adjectival complements. Among these, there are several collocates that are neutral with respect to sentiment, as in "come loose" and "come open," meaning in each case a separation of contiguous material:

(37) a. "It tells me that the door came open." (CBS_48 Hours, 1996)
b. "What if the wobbly slabs come loose?" (BkSF:WestAlongWagon, 1998)
c. "D's face was coming loose in long wet streaks" (SouthwestRev, 2002)

Sentences (37a) and (37b) denote events of material division and (37c) denotes a figurative extension of the same, but none clearly indicates speaker sentiment. This appears to be a coherent lexical semantic group of complements, including *apart*, *open*, *loose*, and *free* that, along with the locative sense of *come*, make up a neutral and restricted change of state class.

In addition to the locative and material separation change of state senses of *come*, however, there is a sense that selects for adjectival complements that do appear to have a bias toward positive sentiment. Common phrases of this type include 'come true,' 'come clean,' and 'come alive':

(38) a. "…all these stories about wishes that come true…" (Bk: CrissCross, 2006)
b. "Corporations trying to come clean by cooperating with the government…" (ABA_Journal, 2004)
c. "…this discovery comes closer than any other to proving, for the first time…" (Bk: PastLives, 1999)
d. "…and as you can see, this is where it comes alive." (CBS_Morning, 1993)

When replaced by similar, negatively oriented adjectives, the phrases become infelicitous:

(39) a. ??...wishes that come false.

b. ??...corporations trying to come deceptive/secretive.

c. ??...the discovery comes far from/to/(?toward) proving…

d. ??...this is where is comes dead/lifeless/unenergetic/boring.

Google's n-gram viewer confirms a higher frequency of 'came good' than 'came bad' in the published books of the latter half of the twentieth century:

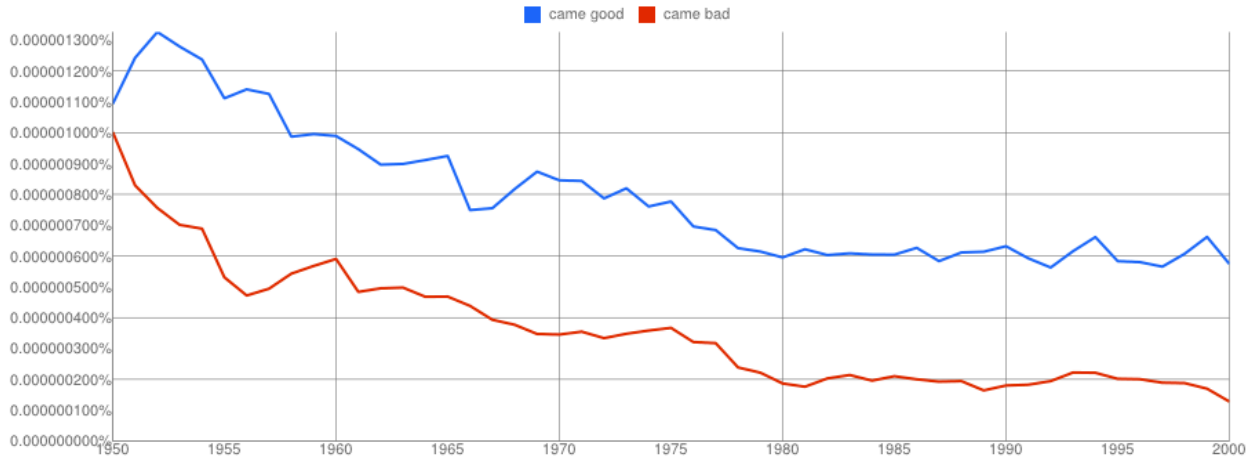

Figure 15: frequency of 'came good' and 'came bad' in Google's collection of published books 1950-2000.

Like *come*, the verb *go* occurs in certain constructions for which speaker sentiment is neutral or even positive insofar as the subject is agentive and the *go* change of state represents an intentional act:

(40) a. "Even when a company goes public in Canada…"` (CanadaLaw, 1999)

b. "Environmentalist Elizabeth Rogers makes going green almost effortless…" (HarpersBazaar, 2010)

c. "Go glam. Lay out the pipe cleaners, fabric scraps…" (Parenting, 1999)

Outside of these intentional *go* change of state usages, however, complements of the verb are surprisingly productive and overwhelmingly negative:

(41) a. "Belly's face goes sick and uncertain." (FantasySciFi, 2010)

b. "I've gone gray as a result of this war." (Denver, 1999)

c. "1,000 homicides in the first half of the decade went unsolved because no one stepped forward." (TIME, 1999)

d. "The U.S. corn industry would go mad if congress threatened to erase sugar protection." (ConsumResrch, 1995)

e. "I caught her, and she went limp in my arms." (Essence, 1992)

f. "I don't mean to go ballistic or anything…" (Bk: UntilEndTime, 1995)

g. "…like trying to explain why some marriages go sour while others blossom." (OutdoorLife, 2005)

h. "We all hear it if things go bad…" (Chicago, 2007)

i. "And he has gone negative." (CNN_Situation, 2006)

The verb also selects for states representing the cessation of some activity, vitality, or energy source:

(42) a. The crowd went quiet.

b. The lights went dim.

c. The food went stale.

The sentences in (42) – with the possible exception of (42c) – are not clearly negative in terms of sentiment, but they are negative or marked in terms of default state or expected

values, which may be the root of the negative sentiment extension of *go*. The evaluative polarity of the latter sense is consistent with and reinforced by the stark difference in relative frequencies of *go* with negative versus positive adjectival collocates:

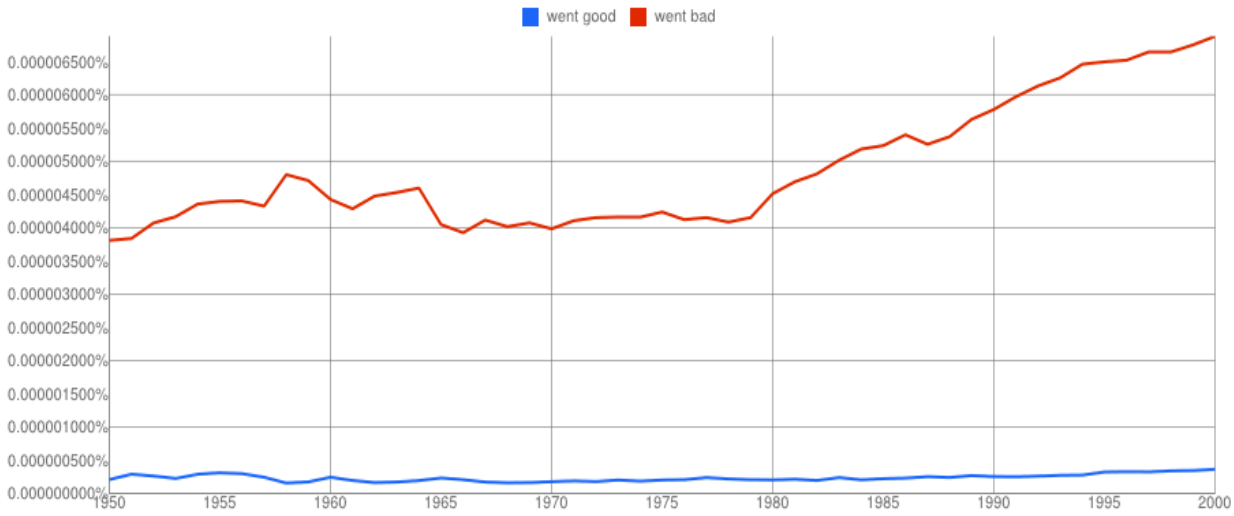

Figure 16: frequency of 'went good' and 'went bad' in Google's collection of published books 1950-2000.

The conclusions from the findings regarding the evaluative status of the verbs examined in this section is aggregated in the table below:

Negative	**Neutral**	**Positive**
Cause, Turn, Go	*Grow*	*Come*

Table 1: Evaluative status of select periphrastic causatives and verbs of becoming in English

A possible explanation for the evaluative polarity of verbs like *come* and *go*, in particular, is the inherent directionality of their basic meanings with respect to the speaker. In their core directional senses, *come* is deictically oriented toward the speaker, while *go* points away from the speaker:

(43) a. Come here/*away
b. Go *here/away

The following subsection examines locative deixis more closely as a metaphor for, and a general influence on, sentiment in language in general, and in the English periphrastic causatives and verbs of becoming in particular.

3.2 SENTIMENT, EMPATHY, AND DEIXIS

Closely related to sentiment is the social meaning component of empathy. Empathy refers here to point of view alignment and emotional self-identification with some participant or position represented or expressed in speech. As self-identification, empathy can be thought of as a proxy for sentiment insofar as one's sentiments are typically aligned with one's social or emotional fellows. For this reason, there is often a direct relationship between the two parameters. In particular, sentiment often tracks empathy and, it seems, empathy tracks deixis. The deictic status of the verbs in question therefore has consequences for interpretation and selectional behavior.

In her study of impersonal uses of person pronouns, Zobel (2011) describes the tendency for indefinite uses of definite pronouns in German and related languages to

signal emotional focus or involvement of the speaker. Following an early version of Malamud (2012), she calls the phenomenon "empathy tracking" and illustrates its robustness by pointing out the difference in interpretation for English sentences like the following:

(44) a. They used to throw you in jail for that.
b. You used to throw them in jail for that.
(adapted from Zobel 2011, 10, attributed to Malamud)

In (44a), the speaker expresses emotional alignment or point of view commonality with the object of the jailing, while in (44b) her empathy is with the subject. In these sentences, emotional identification is signaled by the second person pronoun. Insofar as empathy is signaled by shared point of view or common reference as indicated by pointing or self-referential elements of meaning, it is a potential component of the meaning of deixis in general and deictic verbs in particular.

As it relates to the verbs of becoming and their meanings, deixis bridges the notions of sentiment and distance. As has been elsewhere observed (see Cullicover and Dellert 2008 for a recent study) deictic verbs, when used in an otherwise semantically neutral construction, often reveal an emotional orientation toward certain notions and states. Perhaps the clearest example of this tendency is seen in the behavior of the verb *go* in English when used in the kinds of constructions discussed in section 3.1 above. *Go* as 'become' is most felicitous when used with adjectival predicates that signal a kind of deterioration or other state that the speaker is likely to dis-identify with, or perhaps implicitly to deny or disavow responsibility for:

(45) a. The milk went bad/sour/rotten/*good/*sweet.

b. John went crazy/insane/postal/*intelligent/*likable.

Come, while more restricted than *go*, often signals a positive change of some kind when used to mean 'become,' as illustrated in the idioms "he came around," and "she came clean." Although stable with respect to point of view, these verbs differ in meaning based on directionality.

In its core directional sense, *come* encodes motion toward the speaker, as illustrated in (43). A possible interpretation of this in terms of the empathy-as-deixis hypothesis is that the verb, as deictically oriented toward the speaker, favors complements with which the speaker is eager or willing to identify. The verb, as speaker-centered and proximate, thereby suggests closeness and self-identification and, consistent with the N-gram data in Figure 15, it tends to occur with positive evaluative collocates:

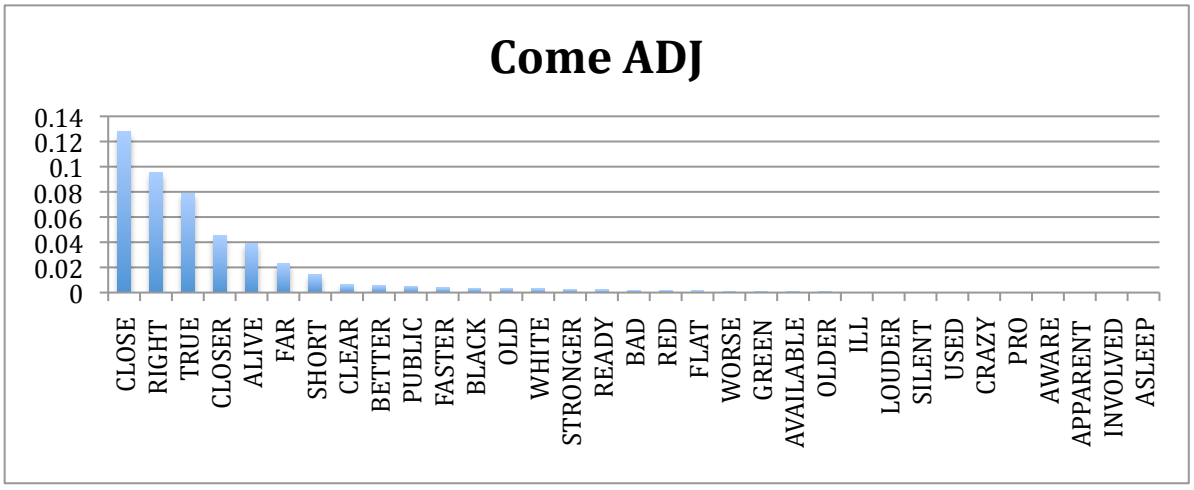

Figure 17: distribution of representative adjectival complements of *come*.

Ignoring the anomalous ranking of some collocates (*true* is, for some reason, ranked more negatively than *silent*, *old*, and *flat*), *come* is more heavily represented on the left (positive) side of the sentiment-ranked graph:

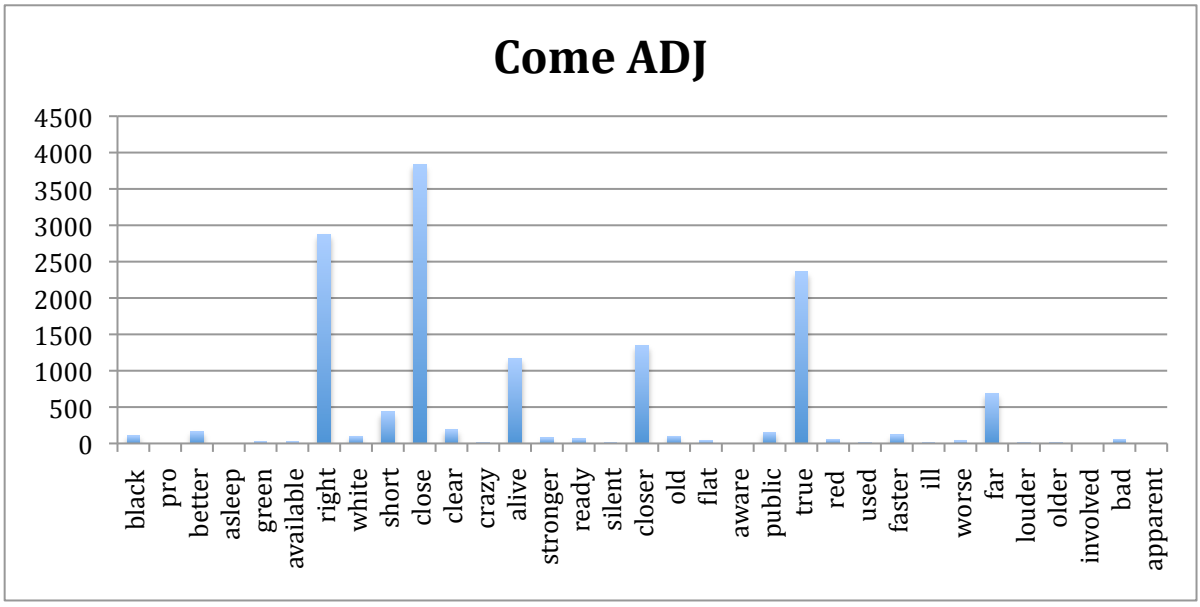

Figure 18: sentiment-adjusted distribution of representative adjectival complements of *come*.

Conversely, the core sense of *go* is speaker-centered and distally directed:

(46) Go ??here/away.

And, when used in the simple change of state sense, it occurs more felicitously with negative (right) adjectival complements than with positive (left) ones, with the obviously confounding terms ignored:

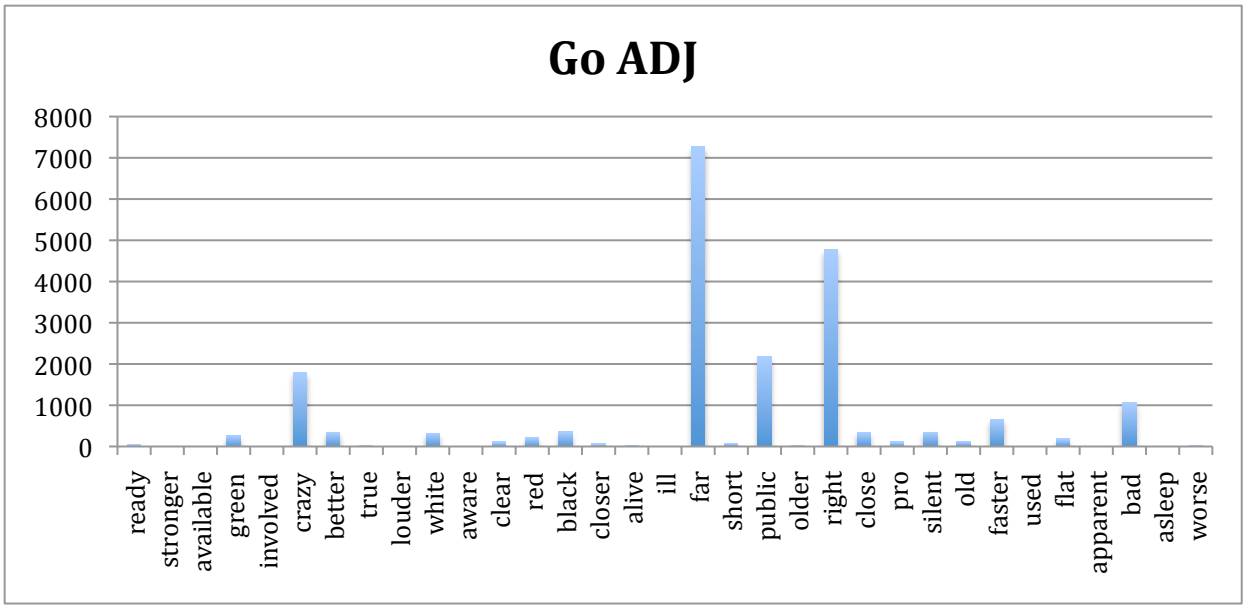

Figure 19: sentiment-adjusted distribution of representative adjectival complements of *go*.

Outside of adjectives like *right* and *far*, which are collocates of the directional-movement sense, and *public*, which occurs with the intentional agentive act of becoming as discussed in 3.1, the most common adjectival complements of *go* include *crazy* and *bad*, both very clearly negatively oriented adjectives[25], reinforcing the N-gram trends illustrated in figure 16.

At least one English periphrastic causative appears to reflect empathetic meaning via deixis: the verb *drive*. As noted in chapter 2, *drive* occurs most frequently with activity verbs, few of which are clearly negative or positive in evaluative orientation:

[25] The relevant sense of 'crazy' is assumed to be non-controversially negative even while the adjective, according to this metric, is unexpectedly deemed positive by Twitter-users. This probably represents the domination of the 'party' or 'exciting' sense for these individuals in this context

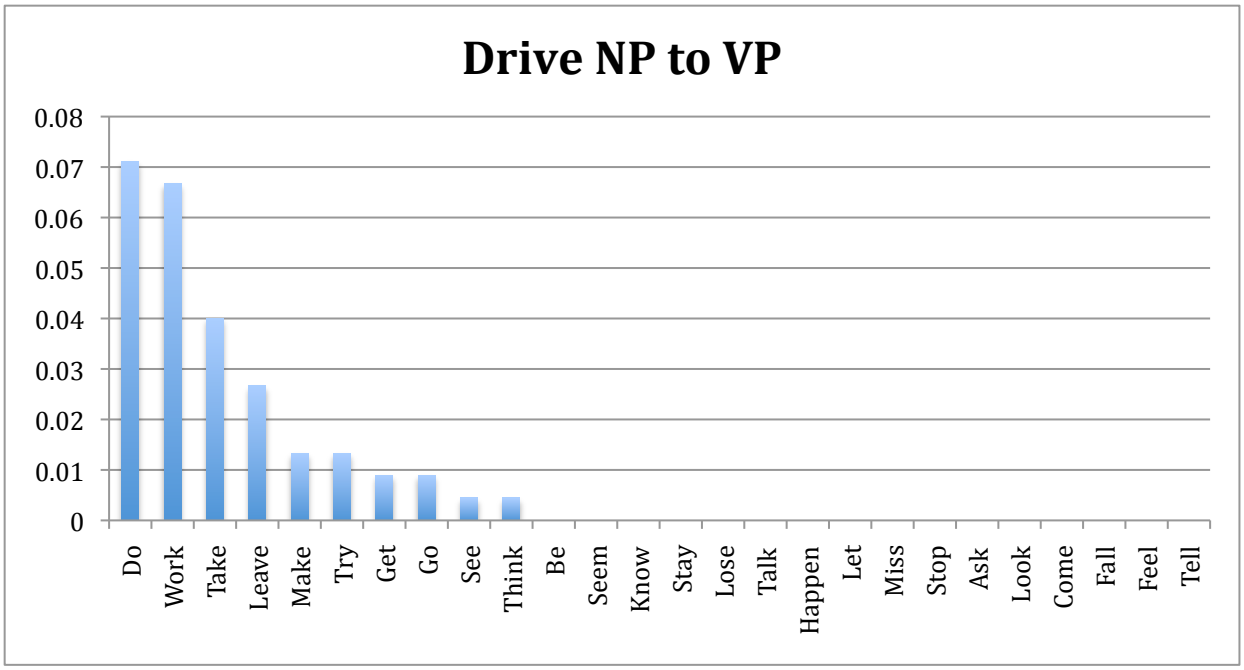

Figure 20: distribution of representative verbs occurring in the complement clause of *drive*.

When the complement clause contains a result state, however, the adjective is almost exclusively restricted to *crazy* and its synonyms[26]:

(47) a. "The one thing that really drove me crazy about her…"
(Bk:WalkToRemember, 2000)

b. "When hunger and thirst threatened to drive him mad…" (Analog, 1998)

c. "It drove him batty." (SportsIllustrated, 2005)

d. "You drive me insane." (Bk:TwoLittleLies, 2005)

An exception to this overwhelming tendency is the collocate *away*:

(48) a. "…and, of course, you drive him further away…" (CNN_Sonya, 1992)

[26] This observation extends to non-APs as well, such as the idiomatic prepositional phrase "out of his mind."

b. "Roman Polanski talks to Diane Sawyer about the scandal that drove him away." (ABC_Primetime, 1994)

This reflects the deictic status of the causative *drive*, which is oriented away from the speaker. Consequently – although the comparison is potentially problematic – the verb occurs with *away* much more frequently than it does with *here*:

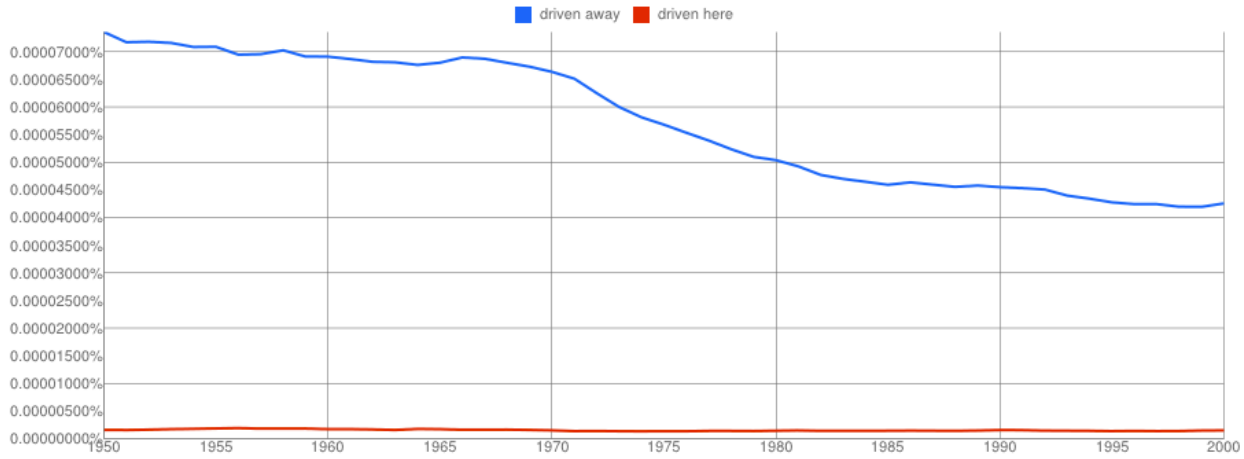

Figure 21: frequency of 'went good' and 'went bad' in Google's collection of published books 1950-2000.

This deictic status might be the reason that, like *go*, *drive* occurs with *crazy* and, in general, seems to be more felicitous with negatively oriented complements than with positively oriented ones[27]:

(49) a. It drove him crazy/*sane/*likable/*enthusiastic.

b. It drove him to depression/*to hope/*to joy.

[27] A subsequent reversal of influence may be responsible for the deictically anomalous "drove him inward."

c. It drove him to drink/?to sobriety.

Despite these tendencies, it is not entirely clear whether deictic status is predictive of evaluative polarity, only that, for these verbs, it tends to correlate. Given the behavior discussed here, however, it is suggestive that in some varieties of English the counterpart for *drive* in constructions like "X him mad" is the similarly outward-directed speaker-centered deictic verb *send*. In addition to German (Zobel 2011), empathy tracking of deictic terms has been observed in Japanese (Oshima 2007b) and the American languages Cree and Navajo (Oshima 2007a), further supporting empathy as a cross-linguistic feature of deixis. Although they are not explored here, the figurative behavior of verbs like *push* and *bring* (joy, pain) could help with further untangling whether speaker sentiment and empathy tracking via deictic orientation is a general tendency among English verbs.

Chapter 4: Register

Several of the verbs of becoming and causing examined here differ with respect to formality in context of use. This kind of variation is something that speakers of a language often have very clear intuitions about, even if they are unable to precisely characterize it. An English speaker knows, for example, that a different type of speech is called for when making a professional presentation to a group of strangers than when making plans for dinner with a loved one. Similarly, a text message to a friend obeys different rules than an email or letter to an employer. The aggregate of these differences is what will be referred to here as 'register.'

In the sociolinguistic tradition, 'register' sometimes refers to a more general phenomenon that might be more intuitively described as 'style,' and, in fact, the two terms are often interchangeable in the literature (see Gregory 1967, 194 for a discussion of the terminological confusion). The relevant scale for the present purposes is that of formality, which interacts with both the field of discourse and the mode of communication, among potentially other criteria, to make up the larger phenomenon of linguistic style. This "formal" versus "informal" distinction is sometimes called 'tenor' by sociolinguists.

The question of what constitutes register intuitions, as well as that of what kinds of linguistic cues track formality, is not yet clearly understood. This section is an abbreviated and mostly suggestive snapshot of intuitive register distinctions, collocation patterns, and n-gram comparisons of a small sampling of the change of state and

periphrastic causative English verbs, pointing to yet another kind of meaning distinction that these verbs are sensitive to and propaedeutic to a more complete treatment.

4.1 'GET' AND 'BECOME'

The verbs *get* and *become* seem, at first blush, to encode little beyond an inchoative change of state. Even on a strictly intuitive level, however, the verbs differentially favor arguments based not necessarily on the state being described, but the choice of word used to describe the state:

(50) a. John got wasted
b. ??John became wasted
c. John became intoxicated
d. ??John got intoxicated

(51) a. John got mad
b. John became angry/?mad

In (50) and (51), the degree of felicity appears to correspond to the degree to which the registers evoked by the verb and adjective correspond[28].

Get appears to favor words that signal an informal register, while *become* is reserved for more formal speech. When these verbs occur with adjectives that evoke the opposite pole of the formality scale, various degrees of register clash result. Figure 22

[28] Another feature for which 'get' and 'become' differ is that of agent volition. 'Get,' but not 'become,' suggests that the change of state was an intentional – or at least cooperative – one for certain sentences containing animate subjects. This difference is illustrated by the sentence "John got married" when compared to the much less likely and pragmatically unusual "John became married." How and whether volition and register interact, however, is unclear to me.

illustrates this phenomenon by means of Google's n-gram viewer, which here displays frequency over a larger time scale than has been used here in the previous uses of this tool for frequency information:

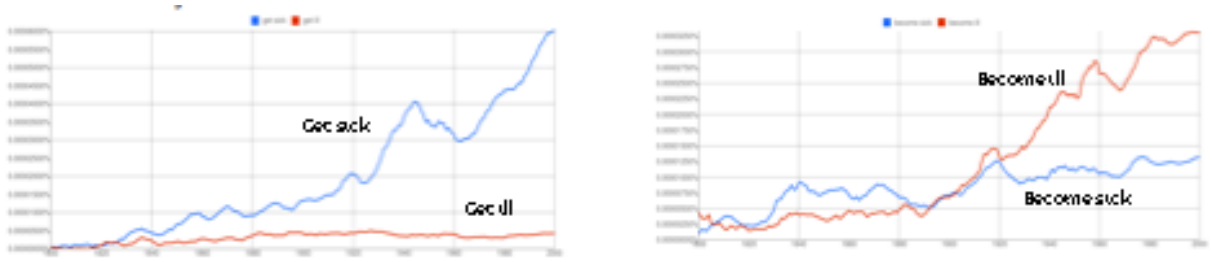

Fig. 22: register clash and meaning divergence – left: 'get sick' vs. 'get ill;' right: 'become ill' vs. 'become sick.

Although the judgments about register for *sick* and *ill* are themselves based only on personal intuition and are therefore only suggestive, if these adjectives do differ in terms of formality, the graphs in figure 22 suggest a divergence over time in acceptability for these verbs and register clashing adjectives. One possible explanation for these data is in terms of evolving lexical pragmatics (see, e.g., Wilson & Carston 2007), with a historical lexical narrowing as linguistic register becomes an increasingly grammatically relevant aspect of meaning for the two verbs and they semantically drift apart along that dimension.

Frequency data for a larger group of arguments drawn from the Corpus of Contemporary American English are consistent with the a general register distinction, beyond these verbs' behavior with *sick* and *ill*. For example, while *become* is common

with Latinate words like *involved* and *apparent*, *get* occurs more often with Germanic words like *used*, *worse*, and *green*. This Latinate-Germanic distinction has indeed been elsewhere proposed as a marker of register differentiation (Bar-Ilan & Berman 2007). The selectional preferences are mostly consistent with respect to this distinction:

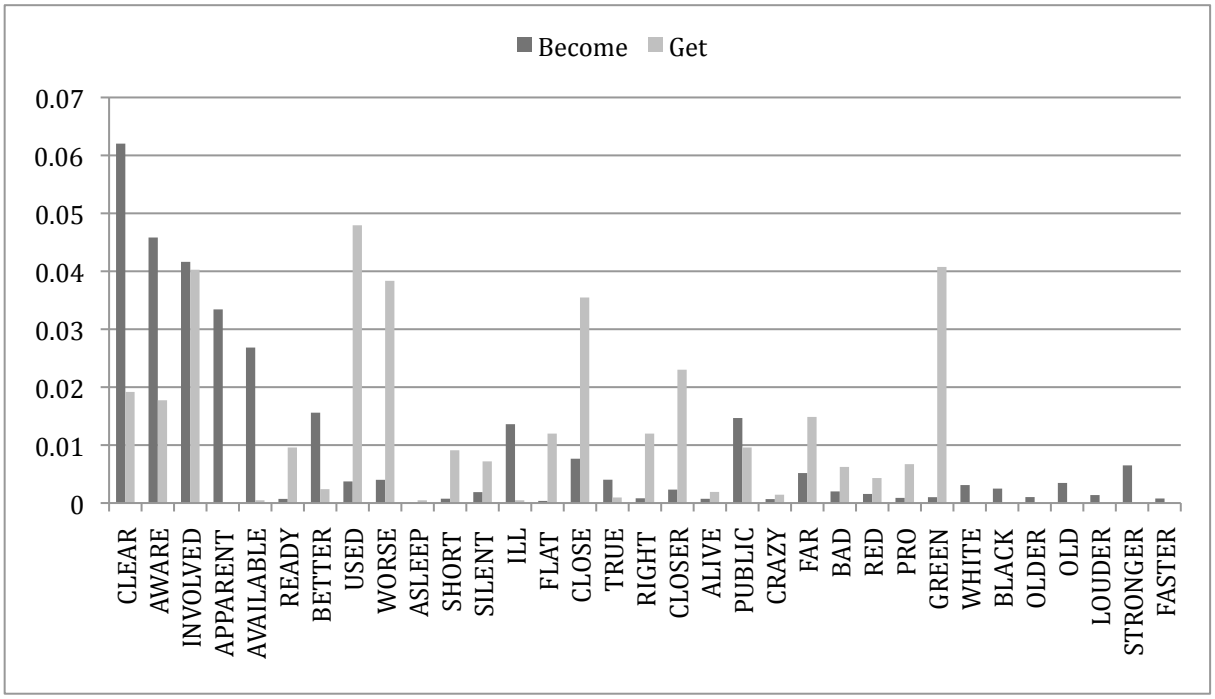

Fig. 23: Collocation frequencies for *become* and *get*.

Except for *aware* and *better*, all of the most common complements of *become* are of Latin origin, while except for *close* and *involved*, all common collocates of *get* are Germanic.

4.2 'LET' AND 'ALLOW'

Let and *allow* are neither as clearly semantically primitive as *get* and *become*, nor are their collocation results as straightforward. It is clear that *let* and *allow* are not light causative verbs in the same sense of *cause* and *make*, for example. One important difference previously mentioned is that, for *let* and *allow*, the "caused" subevent is cancelable. As detailed in chapter 2, *let* and *allow* also encode a kind of facilitation, or removal of obstacle that places the subject of these verbs at a greater remove in the causal chain. Nevertheless, these verbs, like *get* and *become*, seem to bias their arguments in terms of register.

Again, this claim relies on native intuitions about the register difference between possible arguments, which is as yet without empirical support. However, the Latinate – Germanic distinction is maintained for *enter* and *come in*,[29] so if that distinction is indeed a tracker of formality and *enter* is associated with a more formal register than *come in*, Google's N-gram viewer shows some suggestive trends:

[29] According to the Oxford English Dictionary, 'enter' is from the French 'entrer,' while 'come' was Old English 'cuman' from a common German strong verb.

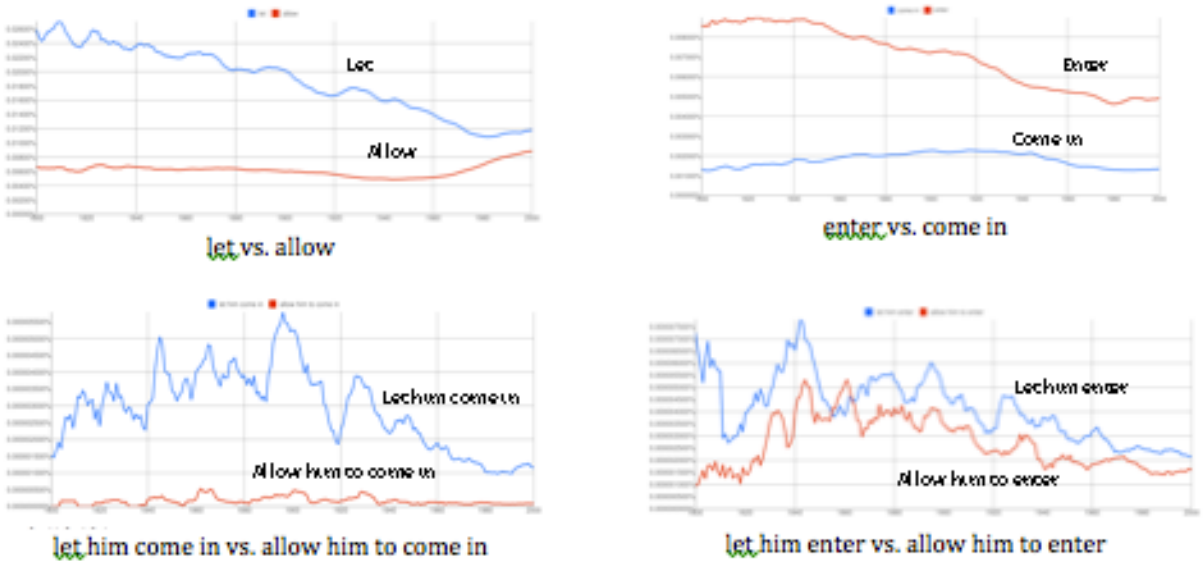

Fig. 24: let/allow come in/enter collocation

The top two graphs in figure 24 show frequency over time of *let* and *allow*, and *enter* and *come in*, respectively. Based on these frequencies, it might be expected that 'let him enter' should be significantly more common than either 'let him come in' or *allow* with either argument. An interesting result is reflected in the bottom two graphs, however. Although *let* with either *come in* or *enter* is more common than either of the *allow* combinations, the frequency counts for 'let him enter' versus 'allow him to enter' are much closer than might be expected from the comparatively large differences in frequency between 'let him come in' and 'allow him to come in.'

One possible explanation for these trends is that, while *let* is not incompatible with formal register, *allow* is infelicitous in an informal context. The may be a stable state in itself or it may perhaps represent some preliminary stage of a divergent semantic

drift. In either case *allow* emerges as a lexically narrowed expression of the general *let*-type facilitative causative with the added semantic feature of formal register. This difference, in conjunction with that between *get* and *become*, suggests that formality is at least in some cases lexically differentiated in the English verbal lexicon, and that it consequently represents a further element of word meaning not represented in current decompositional analyses of lexical semantics.

Chapter 5: Summary and Conclusion

The proposed hierarchy of patient complicity for the English periphrastic causatives is repeated in figure 25, and the status with respect to sentiment and register of the causatives and verbs of becoming that have been the subject of this examination is summarized in table 2 below:

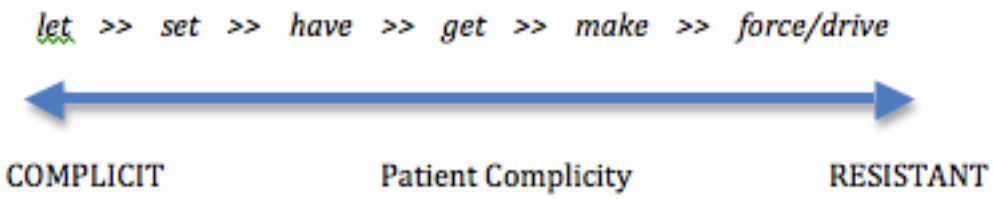

Figure 25: Patient Complicity hierarchy for selected English periphrastic causatives.

	Sentiment	**Register**
Let	*	informal(?)
Allow	*	formal
Cause	negative	*
Drive	negative	*
Become	*	formal
Get	*	informal
Turn	negative	*
Grow	neutral	*
Come	positive	*
Go	negative	*

Table 2: Summary of sentiment and register features for selected English verbs of becoming and periphrastic causatives.

The distinctions represented in Figure 25 and in Table 2 provide an explanation of the differences in selectional properties that were illustrated in (5), which is repeated below as (52):

(52)	a.	It became apparent	a'.	*It got apparent
	b.	John got taller	b'.	*John came taller
	c.	It came true	c'.	*It went true
	e.	He went nuts	e'.	?He became nuts
	f.	It got John interested	f'.	*It drove John interested
	g.	It drove Sara crazy	g'.	*It let Sara crazy
	h.	Mike let the car rust	h'.	*Mike set the car (to) rust
	i.	He set the bird free	i'.	?He got the bird free

Register harmony with the Latinate *apparent* accounts for the felicity of (52a) and the unacceptability of (52a'). Sentiment selection via empathy rules out (52c') while allowing sentences like (52c) and (52e). Likewise, the sentiment preferences of *drive* explain the infelicity of (52f') and the felicity of (52g), while the causally facilitative profile of *let* is compatible with a rusting event (52h), but strange with a going crazy event as commonly conceived (52g'). Finally, the two-part causal initiation and self-agentive process nature of *set* is appropriate for a removal of obstacle plus escape represented by freeing something animate (52i), while 'get-free' is only appropriate when it describes extraction from some stubborn restraint and does not include the suggestion

of subsequent flight[30] (52i'), which accords with the characterization of *get* in sections 2.2 and 2.3.

Although the parameters and meaning components discussed here are not intended to comprise an exhaustive characterization of potential semantic-pragmatic differences among the English periphrastic causatives and verbs of becoming[31], they represent elements of meaning that are outside of primitives and event scaffolding and that nonetheless have clear effects on selectional behavior. These data present a challenge for proposals of lexical decompositions as sufficient models of verb meaning. Parallel considerations suggest that selection restrictions and biases are neither exhausted by common s-selection parameter inventories nor as idiosyncratic as might be suggested by meaning postulates. Rather, verb meaning in English is influenced by a number of regular semantic, pragmatic, and social parameters – including those demonstrated here for our selection of semantically primitive verbs – that are likely to enter in varying degrees into the encoded meaning of the bulk of the predicates in English.

[30] To illustrate this point, note that the preferred reading of (57i') is maintained when "the bird" is replaced with something inanimate, such as "the nail," while such a replacement would make (57i) unacceptable.
[31] For example, additional relevant social meaning parameters might also include politeness, power or status differentiation, degree of agentive volition, and gender among others.

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